

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The Mining Journal is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

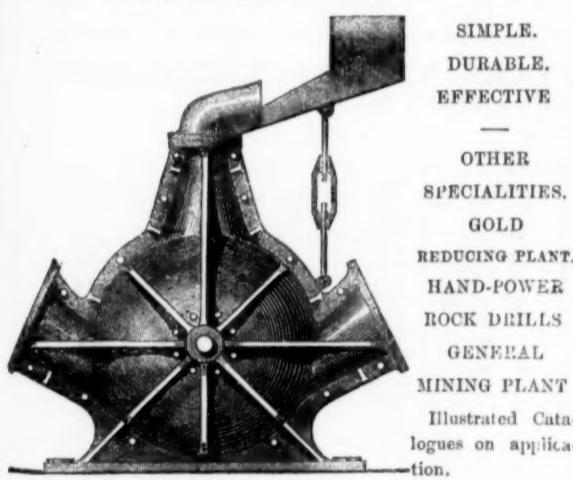
No. 2441.—VOL. LII.

LONDON, SATURDAY, JUNE 3, 1882.

PRICE (WITH THE JOURNAL) SIXPENCE
PER ANNUM, BY POST, £1 4s.



JORDAN'S PATENT
PULVERISING MACHINE,
FOR REDUCING
SPELTERS, CHEMICALS, CEMENTS, CEREALS, &c.
T. B. JORDAN AND SON,
52 GRACECHURCH STREET, LONDON.



SIMPLE.
DURABLE.
EFFECTIVE
—
OTHER
SPECIALITIES.
GOLD
REDUCING PLANT.
HAND-POWER
ROCK DRILLS
GENERAL
MINING PLANT
Illustrated Catalogues on application.

THE
BEST METAL FOR BUSHES,
BEARINGS,
SLIDE VALVES,
An other wearing parts of Machinery.
PUMPS, PLUNGERS,
CYLINDERS, &c.
PHOSPHOR BRONZE
WIRE, TUBES,
SHEET, RODS
TOOLS, &c.
STEAM
FITTINGS.
THE
PHOSPHOR BRONZE
COMPANY, LIMITED,
SUMNER STREET, SOUTHWARK,
LONDON, S.E.

ASBESTOS.

ASBESTOS ENGINE PACKING,
ASBESTOS MILLBOARD JOINTING
A BESTOS BOILER COVERING
ASBESTOS CEMENT,

ARE UNRIVALLED.

Price Lists and all information from the UNITED ASBESTOS COMPANY (LIMITED);—
HEAD OFFICES: 161, QUEEN VICTORIA STREET, LONDON,
WORKS: ROME TURIN, AND GLASGOW.

IMPROVED PATENT
INGERSOLL
ROCK DRILL
MEDALS AND HIGHEST AWARDS.

American Institute, 1872.
American Institute, 1873.
London International Exhibition, 1874.
Manchester Scientific Society, 1875.
Leeds Exhibition, 1875.
Royal Cornwall Polytechnic, 1875.
Paris Exhibition, 1878.

Rio de Janeiro Exhibition, 1875.
Australia Brisbane Exhibition, 1876.
Philadelphia Exhibition, 1874.
Royal Cornwall Polytechnic, 1877.
Mining Institute of Cornwall, 1877.
Paris Exhibition, 1878.

LE GROS, MAYNE, LEAVER, & CO.,
60, Queen Victoria Street, London, E.C.,
SOLE AGENTS FOR THE

DUSSELDORF
WROUGHT IRON STEAM TUBE WORKS.

TUBES FOR BOILERS, PERKINS'S, and other HOT-WATER SYSTEMS.
For Catalogues of Rock Drills, Air Compressors, Steel or Iron Steam Tubes,
Boiler Tubes, Perkins's Tubes, Pneumatic Tubes, Boring Tubes, and all kinds of
Machinery and Mining Plant, apply—

60, QUEEN VICTORIA STREET, E.C.

NORMANDY ROCK DRILL.
NORMANDY AIR COMPRESSOR.

THESE PATENT MACHINES ARE VALVELESS.

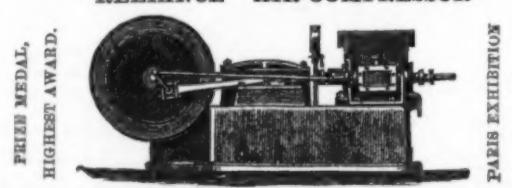
RESULTS OF TRIALS at CARDIFF EXHIBITION, on a block of Cornish Granite, on 24th September, 1881:

	Inches.	min. sec.
Normandy Rock Drill and Air Compressor, bored	1 1/4 x 10 1/4	in 2 10
Eclipse Rock Drill and Reliance Air Compressor	1 1/4 x 10 1/4	in 2 25
Beaumont Rock Drill and Sturgeon's Trunk Air Compressor	1 1/4 x 7 1/2	in 2 30

Normandy's have WON TWO GOLD MEDALS at the Melbourne Exhibition, 1880, and being the simplest, ARE MUCH THE CHEAPEST in first cost and in repairs.

A. NORMANDY, STILWELL, & CO.,
OPPOSITE CUSTOM HOUSE STATION,
VICTORIA DOCKS, LONDON, E.

THE PATENT
“ECLIPSE” ROCK-DRILL
AND
“RELIANCE” AIR-COMPRESSOR



PATENT MEDAL,
HIGHEST AWARD.
ARE NOW SUPPLIED TO THE
ENGLISH, FOREIGN, AND COLONIAL GOVERNMENTS
And are also in use in a number of the
LARGEST MINES, RAILWAYS, QUARRIES, AND HARBOUR
WORKS IN GREAT BRITAIN AND ABROAD

FOR ILLUSTRATED CATALOGUE AND PRICES, apply to—

HATHORN & CO., 22, Charing Cross, London, S.W.

“Kainotomon” Rock Drill
SELECTED BY THE
BRITISH, PRUSSIAN, & SAXON
GOVERNMENTS.

OPEN TO ACT AS CORRESPONDENT
OR AGENT TO



FOREIGN OR COUNTRY
COMPANIES.

SUPERIOR AIR COMPRESSORS.
MACHINERY OF EVERY DESCRIPTION.

T. A. WARRINGTON,
30, King-street, Cheapside, London.

THE
“Barrow” Rock Drill
COMPANY.



The DRILLS are exceedingly SONG, LIGHT, SIMPLE, and adapted for ends, stopes, quarries, and the sinking of shafts, ... can be worked by any miner.

TheIR DRILLS have most satisfactorily stood the TEST of LONG and CONTINUOUS WORK in the HARDEST KNOWN ROCK in numerous mines in Great Britain and other countries clearly proving their DURABILITY and POWER.

About 200 are now at work driving from three to six times the speed of hand labour, and at from 20 to 30 per cent. less cost per fathom. They can be worked by any miner.

For PRICES, Particulars and Reports of Successful and Economical Working, apply to—

LOAM AND SON,
LISKEARD, CORNWALL.

ROCK DRILLS AND AIR COMPRESSORS

WARSOP AND HILL, ENGINEERS, NOTTINGHAM,
ARE PREPARED TO CONTRACT FOR
DRIVING LEVELS OR SINKING SHAFTS, &c., by machinery
with all the recent improvements to ensure rapid advance; or to
SUPPLY and FIX PLANTS, complete.

STEAM CAPSTANS AND UNDERGROUND HAULAGE A
SPECIALITY

FIRST AWARD.
SYDNEY, 1870.



SILVER MEDAL OF THE MINING INSTITUTE OF CORNWALL, TRURO, 1880,
FOR AN IMPROVED METHOD OF SIMULTANEOUS BLASTING.

FOR SIMULTANEOUS BLASTING.

BICKFORD, SMITH AND CO.,

THE INVENTORS, AND ORIGINAL PATENTEES AND MANUFACTURERS OF

SAFETY AND INSTANTANEOUS FUSES AND IGNITERS

FOR USE IN ALL BLASTING OPERATIONS AND SPECIALLY PREPARED FOR ANY CLIMATE

Note the TRADE MARK: Two Separate threads through centre of Fuse.

BICKFORD, SMITH AND CO.'S Patent Igniters and Instantaneous Fuses for simultaneous blasting are being extensively used at home and abroad. This improved method is the cheapest, simplest, and most dependable ever introduced for simultaneously firing any number of charges. For full particulars, see Descriptive Catalogue.

PRICE LISTS, DESCRIPTIVE CATALOGUES, AND SAMPLES TO BE HAD ON APPLICATION.

FACTORIES—TUCKINGMILL CORNWALL; AND ST. HELENS JUNCTION, LANCASHIRE.

HEAD OFFICE—TUCKINGMILL, CORNWALL.
LANCASHIRE OFFICE—ADELPHI BANK CHAMBERS, SOUTH JOHN STREET, LIVERPOOL
LONDON OFFICE—85, GRACECHURCH STREET, E.C.

Every package bears Bickford, Smith, and Co.'s copyright label.

ESTABLISHED 1850



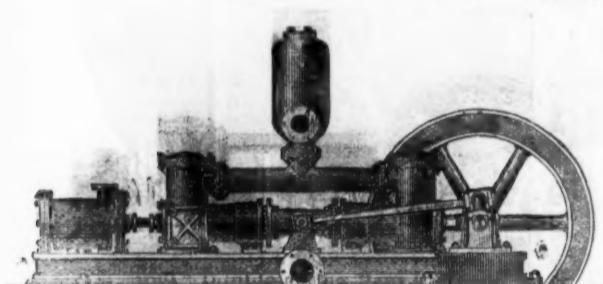
WILLIAM TURNER,

(LATE OMMANNEY AND TATHAM),

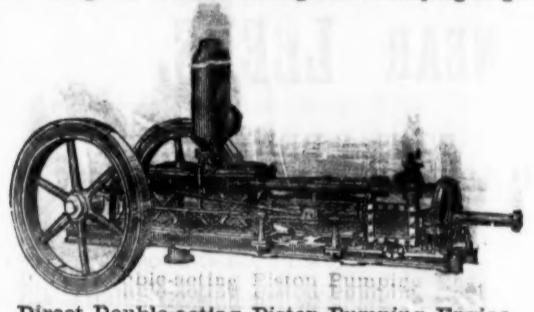
SALFORD, MANCHESTER.

FLY WHEEL PUMPING ENGINES

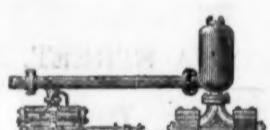
ARE THE ONLY RELIABLE ENGINES FOR STEADY WORK AND ECONOMY.



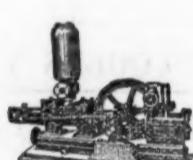
The "Original" Double-acting Ram Pumping Engine.



Direct Double-acting Piston Pumping Engine.



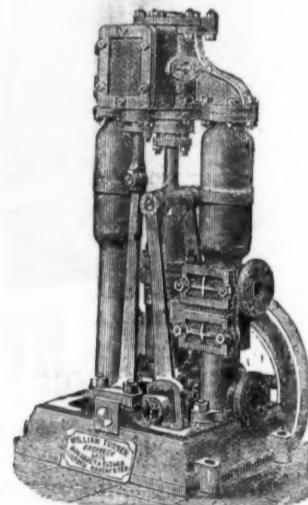
Hydraulic Pumping Engine for Collieries.
Worked by Natural Head of Water, and saving much manual labour.



Double-acting Horizontal Pumping Engine.
For Feeding Boilers, Gas Works, Tanneries, Breweries, and all Pumping Purposes.



WIPPERMANN AND LEWIS'S PATENT AIR INJECTOR.
These Injectors are being universally adopted for Pumping Engines for Collieries & Waterworks.



The Salford Pump.

PUMPING ENGINES of all descriptions.

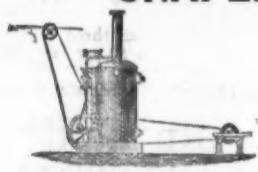
WINDING Ditto.

AIR COMPRESSORS.

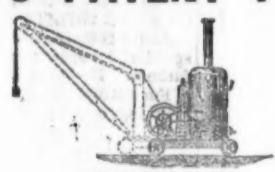
HYDRAULIC ENGINES.

VALVES for Steam, Water, &c.

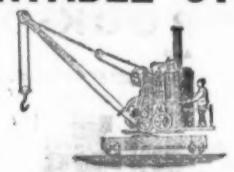
CHAPLIN'S PATENT PORTABLE STEAM ENGINES AND BOILERS.



STATIONARY ENGINE.
No Building required.



HOISTING ENGINE.
With or without Jib.



*STEAM CRANE.
For Wharf or Rail.



CONTRACTORS'
LOCOMOTIVE.



SHIPS' ENGINE
AND DISTILLER.



PUMPING AND
WINDING ENGINE.

* These Cranes were selected by H.M. Commissioners to receive and send away the Heavy Machinery in the International Exhibitions 1862, 1871, and 1872.
The ORIGINAL combined Vertical Engines and Boilers, introduced by Mr. ALEX. CHAPLIN, specially designed and adapted for PUMPING, WINDING, HOISTING, SAWING, DRIVING MACHINERY, and for GENERAL CONTRACTORS' WORK, RAILWAY SIDINGS, COAL MINES, QUARRIES, GAS WORKS, &c.

THE AGRICULTURAL AND GENERAL ENGINEERING COMPANY (Limited),

LATE WIMSHURST, HOLICK, AND CO., ENGINEERS

CITY OFFICES:—2, WALBROOK, LONDON, E.C.

WORKS—REGENTS CANAL DOCK, 602, COMMERCIAL ROAD EAST.

I. COBLEY & CO., ENGINEERS AND BOILER MAKERS, MIDDLESBOROUGH, YORKSHIRE.

SOLE MAKERS

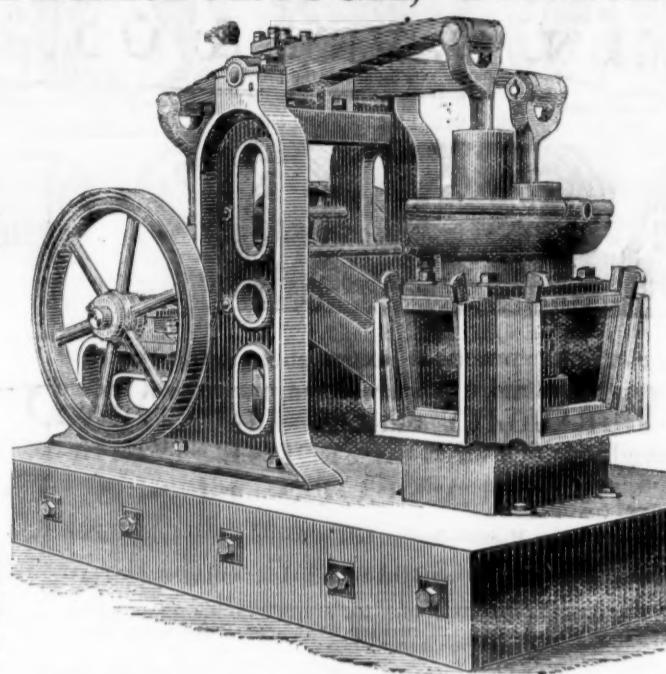
OF

DUNHAM'S
AMERICAN SPRING BEAM
ORE STAMPS.

COMBINING ALL THE FEATURES WHICH
EXPERIENCE HAS BROUGHT ABOUT IN REDUCING

GOLD QUARTZ.

These Machines are guaranteed to
reduce more Quartz with less applied
power than any Machines in the market.



THIS MACHINE CAN BE SEEN
WORKING IN LONDON STAMPING
"GOLD QUARTZ,"
INVITATIONS WITH
PROSPECTUSES WILL BE SENT
TO THOSE INTERESTED ON
APPLICATION.

N.B.—Quartz from abroad reduced
for analysis through meshes of 400 to
900 holes to the square inch.

GOLD QUARTZ STAMPER.

LONDON AGENT:—A. H. REED, 90. CANNON STREET, E.C.

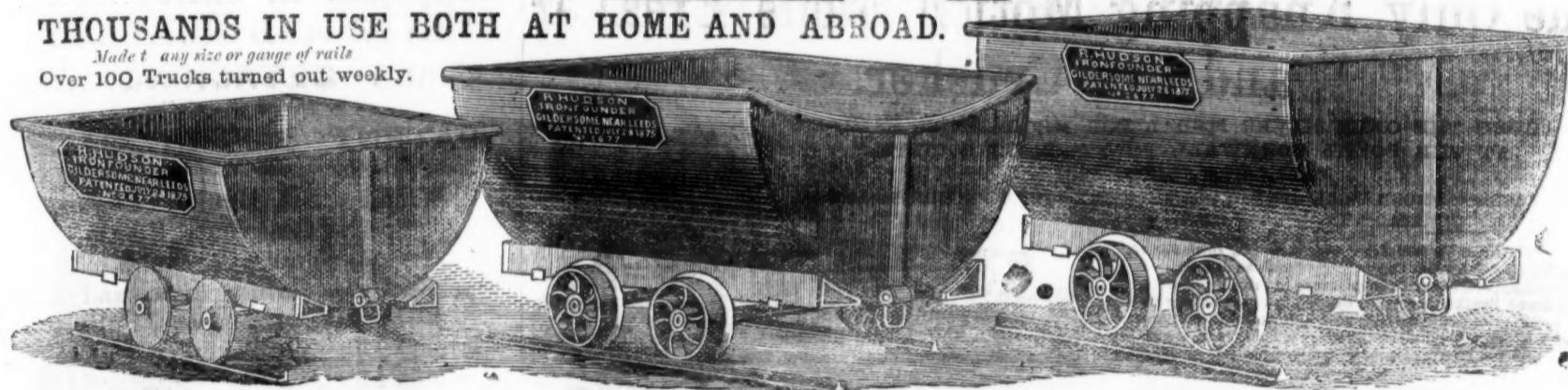
R. HUDSON'S PATENT STEEL (OR IRON) TRUCKS

ARE THE
LIGHTEST, STRONGEST, AND MOST CAPACIOUS MADE.

PATENTED EUROPE, AMERICA, AND BRITISH SOUTH AFRICA, No. 2677, No. 50, No. 2782, No. 102, AND NO. 4683.
WITH OR WITHOUT "END" DOORS AND "SWIVELLING" UNDERCARRIAGE FOR
TIPPING AT EITHER SIDE OR END OF RAILS.

THOUSANDS IN USE BOTH AT HOME AND ABROAD.

Made to any size or gauge of rails
Over 100 Trucks turned out weekly.



R. HUDSON, GILDERSOME FOUNDRY, NEAR LEEDS.

MANCHESTER WIRE WORKS.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1790).



JOHN STANIAR AND CO.,
Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for
LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper
EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES

PERFORATED IRON, STEEL, COPPER, AND ZINC PLATES IN VARIOUS DIMENSIONS AND THICKNESSES.
Shipping Orders Executed with the Greatest Dispatch



THE "BEAUMONT" PATENT PERCUSSIVE ROCK DRILL.

(BEAUMONT AND FOSTER'S PATENT.)

The "BEAUMONT" DRILL is now offered to the public.

For the last three years it has been solely used with complete success by the Aqueous Works and Diamond Rock Boring Company (Limited), and Messrs. Beaumont and Co. in their several large contracts.

During this time it has been improved and developed as to make it without doubt the best Percussive Rock Drill offered for Tunnelling, Mining, or Quarrying Work.

Price and prospectus on application to the Manufacturer,

JOSEPH FOSTER,
MINING ENGINEER
BOW LANE IRONWORKS,
PRESTON, LANCASHIRE.

THE AQUEOUS WORKS AND DIAMOND ROCK-BORING COMPANY (LIMITED).

CROWN WORKS, GUILDFORD STREET, YORK ROAD,
LAMBETH, LONDON.

MESSRS. BEAUMONT AND CO.,
3, VICTORIA STREET, S.W., WESTMINSTER, LONDON.

Tripods, Tunnelling Carriages, Gadding Cars, Air
Compressors, Air Pipes, and other Mining
Machinery supplied.

GOLD MEDAL AWARDED, PARIS EXHIBITION. 1878.

THOMAS TURTON AND SONS,

MANUFACTURERS OF

MINING STEEL of every description.

CAST STEEL FOR TOOLS. CHISEL. SHEAR. BLISTER. & SPRING STEEL
MINING TOOLS & FILES of superior quality.

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS.

LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

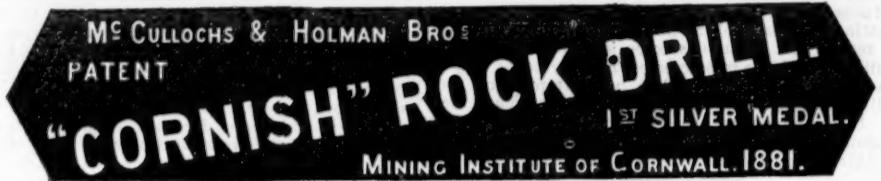
SHEAF WORKS & SPRING WORKS, SHEFFIELD.

Pumping Engines
for
Mines, Water Works,
Sewage Works,
and
General Purposes.
CATALOGUES ON

PUMPING & MINING MACHINERY.

HATHORN, DAVEY, & CO., LEEDS.

Hydraulic Pumps.
Winding Engines.
Air Compressors.
Man Engines.
Capstans,
&c., &c.
APPLICATION.



This machine has been constructed after a long practical experience in the requirements necessary for Cornish mines. The result has more than realised our expectations. Our chief objects in view were GREATER DURABILITY and LESS LIABILITY TO DISARRANGEMENT, but it has also proved itself MORE EFFECTIVE. (Vide Report.)

CAMBORNE, 8TH DECEMBER, 1881.

SIR,—Having been requested by the Council to superintend the Rock Drilling Machine Contest, held at Dolcoath Mine to-day in connection with the above Institute, I beg to hand you the following report:—

The competing machines were the "Barrow," the "Cornish," and the "Eclipse"—each was fixed on the same mounting bar, and bored into the same stone. The result of the boring were as follows:—

Name of Machine.	Diameter of cylinder.	Diameter of Drill.	Time boring.	Depth bored.	Cubic inches of ground cut.	Cubic inches cut per minute.	Mean pressure per square inch.	Remarks.
	In.	In.	Min. Sec.	In.			Lbs.	
Cornish.....	3½	—	1 15	4½	14·1	—	—	
".....	—	14	55	9	21·6	—	—	
Total.....	3½	—	2 10	13½	35·7	16·4	61	
Eclipse.....	3½	2	—	40	—	—	—	
" second try	3½	2	2 0	1	3·1	—	—	Ran into Cornish hole; hole not properly watered.
" third try	3½	2	2 35	11½	35·3	13·6	60	
Barrow.....	4	14	—	15	—	1·2	—	Gland to mounting bar broke.
".....	—	—	2 0	8½	19·18	—	—	
Total.....	4	14	2 15	92	21·0	9·3	60	

I am, Sir, your obedient servant,

JAMES HOSKING, M.E.

To R. H. Williams, Esq., C.E., President of the Mining Institute of Cornwall.

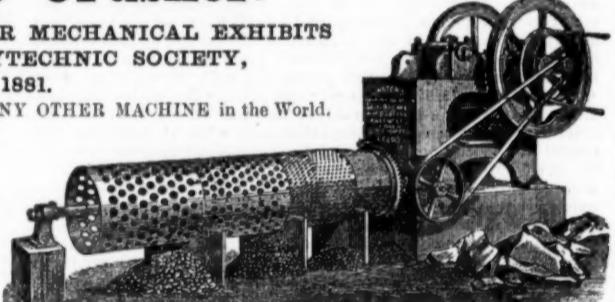
Address—
HOLMAN BROS.,
CAMBORNE FOUNDRY AND ENGINE-WORKS, CAMBORNE, CORNWALL.

The Only Knapping Motion Stone Breaker and Ore Crusher.

AWARDED THE ONLY SILVER MEDAL FOR MECHANICAL EXHIBITS AT THE ROYAL CORNWALL POLYTECHNIC SOCIETY, FALMOUTH, SEPT., 1881.

GUARANTEED to do MORE WORK with less power THAN ANY OTHER MACHINE in the World.
READ THIS—

The Bold Venture Lime and Stone Co., Peak Forest, June 8, 1881.
Messrs. W. H. Baxter and Co.,
GENTLEMEN.—We have the pleasure to inform you that the 20 by 9 Stone Breaker supplied by you is now working to our entire satisfaction, and we are now able to fulfil our contract with ease, which we had much difficulty in doing before with the Blake Machine. It takes less power and turns out considerably more stone.
Yours truly,
BOLD VENTURE LIME AND STONE COMPANY.



GUARANTEED NO INFRINGEMENT OF ANY OTHER PATENT.

These Machines turn out the same amount of work with less than half the power, and make a better sample of Road Metal, with 50 per cent. less waste, than any other machinery, and for Crushing Purposes they are still more advantageous, as the sudden action entirely dispenses with the clogging when used for crushing softer materials, and thereby saves many breakages and a great waste of power. There is also a saving of fully 75 per cent. of lubrication required over the Blake Machine, and as a proof of this, our driving shaft never becomes heated. We are also prepared to guarantee our driving shaft from breakage in any of our Knapping Motion Stone Breakers.

We have already supplied our Machines to Derby, Harrogate, and Falmouth Local Authorities; besides several Quarry Owners, Contractors, Plaster Manufacturers, Mining Companies, &c.

FOR FULL PARTICULARS ADDRESS TO THE PATENTEE AND SOLE MAKERS,

W. H. BAXTER & CO., ALBION STREET, LEEDS.

SOLE AGENTS FOR LONDON AND DISTRICT—
THOMAS GREEN AND SON (LIMITED), ENGINEERS, BLACKFRIARS ROAD, LONDON, S.E.

ESTABLISHED 1860.

HUDSWELL, CLARKE, AND CO., LEEDS.



SOLE MAKERS OF RODGERS' PATENT WROUGHT-IRON PULLEYS.

LOCOMOTIVE TANK ENGINES

OF ALL SIZES AND ANY GAUGE OF RAILWAY.
OF GREATLY IMPROVED CONSTRUCTION
FOR MAIN OR BRANCH RAILWAYS.
CONTRACTORS, IRONWORKS, COLLIERIES.

For Cash or Deferred Payments.

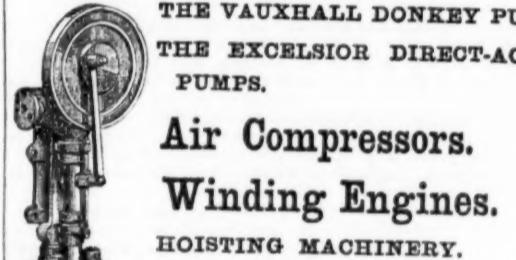
THE "E. W." IMPROVED SOLID BLASTING CARTRIDGE,

MANUFACTURED BY
The Elter Water Gunpowder Co., (LIMITED), AMBLESIDE.

This Solid Cartridge is superior to all compressed Cartridges now in the market, as it leaves no space behind the stemming, the advantage of which is well known by every Miner and Quarryman.

Each Cartridge bears on the ends the Trade Mark "EW" as a guarantee of explosive power, and all casks and packages, containing the Company's manufactured Powder bear their Trade Mark "EW." Attention is called to this in consequence of recent infringements, which have been restrained by injunction.

ALEX. WILSON & CO., VAUXHALL IRONWORKS, LONDON, S.W.,
MANUFACTURERS OF THE VAUXHALL DONKEY PUMPS, THE EXCELSIOR DIRECT-ACTING PUMPS.



Air Compressors.
Winding Engines.
HOISTING MACHINERY.

ILLUSTRATED AND PRICED CATALOGUES ON APPLICATION.

"KING AND HUMBLE'S" PATENT DETACHING HOOK

To prevent over winding

PATENT SAFETY CAGE,

suspend in Shaft in cases of fracture of Winding Rope

Winding and Hauling Engines,

Special Centrifugal Pumps,

Weighing Machines,

Steel Castings, Mining Steel and Tools,

Winches, Steel Shovels, Pulleys,

Mining Machinery of every description.

Brick Machinery and Mortar Mills.

Stephen Humble, Engineer, Derby.



ESTABLISHED 1820.

JOSH. COOKE AND CO., SAFETY LAMP

AND GAUZE MANUFACTORY,

Honourable Mention, Paris Exhibition, 1878.

Illustrated Price Lists free, by post or otherwise.

MIDLAND DAVY LAMP WORKS,

Belmont Passage, 203, Lawley-street,

BIRMINGHAM.

Makers of Williamson's Double Safety Lamp, Williamson's Patent Double Safety Lamp shown half in section.

Medal—For Improved Invention—London, Kensington, 1874.

Ditto—Excellence of Workmanship—Wrexham, 1876.

FRANCIS AND JENKINS, GREENFIELD WORKS, LLANELLY, S. WALES,
MANUFACTURERS OF THE

Improved Solid Steel Shovels, C. S. Forks, Solid Steel Miners' Shovels, Railway and Miners' Picks, Steel-pointed Spades and Shovels, Draining and Grafting Tools,

ALSO MANUFACTURERS OF

COPPER WORKS' LADLES

To which special attention is given.

RABBLE HEADS, PADDLES, AND EVERY DESCRIPTION LIGHT HAMMERED WORK.

JUNE 3, 1882.]

SUPPLEMENT TO THE MINING JOURNAL.

677

Original Correspondence.

GOLD AND DIAMOND MINES OF SOUTH AFRICA.

SIR.—The slight fall in the price of diamonds does not appear to have had any material effect on our share market, which is more firm now than it has been during the last six months. I informed you in my last that "there was an improvement in many companies," and I am pleased to say there is every appearance of this improvement being permanent. There are, at the same time, a large number of questionable concerns which must be wound-up sooner or later, and the sooner the better for the true interest of Kimberley. The proprietors of the celebrated Kimberley Mine are at last fully alive to the importance of getting over the reef difficulty with as little delay as possible, and if they continue to remove reef at the present rate they will at the end of twelve months have disposed of at least 500,000l. worth of their reef liability, and nine out of the fourteen companies will be in a position to pay dividends. The Central Company (Kimberley) have about 60 claims clear of reef, notwithstanding which I doubt whether they will pay a dividend of over 10 per cent. for the quarter. I am much surprised at this, as I know the property is capable of paying fully 25 per cent. per quarter. The Barnato Company is doing very well just now. It would astonish some of your readers to see the large quantity of diamonds taken out by this small company daily. Their manager, Mr. Pippin, is one of the most diligent and trustworthy men on these fields. The British Company are finding well, and have already earned their next quarter's dividend of fully 12 per cent. The Standard Company are also doing well at present, and if they do not get another fall of reef (which is somewhat doubtful) they will pay a fair dividend during the next four months. The companies, whose ground has been so long buried under fallen reef, have a ray of hope at last, and are not so anxious to part with their shares as they were only a month ago. The claims in the west end of the Kimberley Mine are being worked; but the stuff (diamond soil) is being thrown away, and is of no value.

At the De Beers Mine I am pleased to notice the Central Company have declared a dividend of 4 per cent., but generally there is not much improvement in this mine. At Jagersfontein things are in a sad state; none of the companies are doing any good. Last week seven claims—for which 3000l. per claim was refused twelve months ago—were put up to auction, the highest bid being 51l. per claim. As a matter of fact, both prices were absurd. These claims were never worth anything like 3000l. per claim, and they are certainly worth more than 51l. per claim now—a fair price would be 200l. per claim. At Kamsersdam they are improving slowly; they found yesterday a nice stone, weighing 17 carats. As soon as they have a sufficient supply of water I have no doubt but that they will pay very well. The Messrs. Hampson, who have found the bulk of the cash for the development of Kamsersdam are men of sterling character, above suspicion, and are certainly deserving of success. Otto's Kopje promises to be a success, and if all the claimholders could be induced at this time to sell their claims at a reasonable price it would be a fine property for a good European company.

Yesterday I took a turn through the Bultfontein Mine; there were about 800 white men employed, and between 3000 and 4000 blacks. The area of payable diamond soil is about 900,000 square feet, the average value of which is about 8s. per ton. When this mine was worked by private individuals it paid very well, but since it has been formed into companies it has been a failure. The mine throughout can only be characterised as in a very dirty and disorganised state. This is owing principally to the stupid manner in which the London and South African Exploration Company have laid out this estate. The mining sites and town allotments, stores, canteens, mining machinery, and conventicles being all crossed by small trams and hauling gear, are more difficult to unravel than a Chinese puzzle. This disorganised state of affairs around the Bultfontein Mine is not only the chief cause why the companies do not pay dividends, but it causes a serious depreciation of the London and South African Exploration Company's property. The Kimberley Waterworks are progressing very satisfactorily; the laying of the first pipe was performed by the Mayor last week. I am afraid the water will not be here by Christmas, as most people expected; however, such men as Mr. T. Lynch and Mr. Buchanan can do a great deal in eight months.

About four weeks ago I informed you that the principal officers of the Transvaal State had formed a Trading Association, and had sold to themselves at a nominal price all the stuff plundered from British subjects before and during the war. It has since transpired that the Association is not to pay anything for those captured stores. The Pretoria Advertiser referring to this matter says "the Government ought to be impeached." The Transvaal Government are certainly prolific in their various modes of insulting the English. They have, pursuant to a request preferred by some burghers from Pretoria, resolved to lay before Volksraad the following proposal—"That all English people who have not sworn allegiance to the Transvaal Republic who bring property of any kind into the markets for sale shall produce written evidence that such property is not stolen, and that on non-compliance with this provision such property be confiscated." There can be no doubt that while there are English people in the Transvaal with capital the Boers will be able to find some means of subsistence. Most of the monopolists who secured concessions from the Transvaal Government in a clandestine manner for the purpose of promoting "gold mining swindles" are beginning to repent of their bargains. I am sure English speculators will be pleased to know that the respectable portion of the South African Press are loud in condemning the attempts at rascality in the Transvaal, and are acting entirely *pro bono publico*. The Natal Witness (who is well informed on the subject) speaking of the alleged discoveries of gold in the Transvaal says—"Until authentic information is obtained from experienced diggers who have visited the spot the story must be accepted with considerable hesitation. Gold in large quantities sufficient to make good paying permanent fields has not been discovered in the Transvaal in the past, although much diligent search has been made for it—and we do not incline to the belief that even now such an important discovery has been made. There are amongst the alien population of the Transvaal hundreds of speculators, men without the least particle of honour, who are, in fact, accomplished swindlers."

Such a statement coming from a paper whose interest it is to promote mining of any kind will convey to your readers a correct idea of the character of the parties who are trying to float bogus companies in the Transvaal. However, I have given your readers timely warning, and have given them a true description of the Transvaal gold fields; if, therefore, they allow themselves to be swindled they will have themselves to blame. I have pointed out from the first that there are three or four places only that will pay, and these places are already in the hands of diggers who are doing very well with them. I saw a letter on Monday from the manager of the claims of Messrs. White, Hampson, and Cope, at Waterfall, with a statement of accounts for two months; they have no machinery, and simply bruise the vein with hammers, and yet the profits are 100 per cent. over the working expenses. This is certainly very good, and I know of two other places almost if not equally as good; and, as I have remarked in previous letters, it is on the strength of these places that so many adventurers are trying to perpetrate frauds. At Pilgrim's Rest Mr. Benjamin has not yet succeeded in wresting from the diggers the only claims known to be payable, and here he appears to have stuck; for, although his concession covers an area of over 70,000 acres, he has by his conduct demonstrated the fact that there is no ground outside the few claims held by the old diggers sufficiently auriferous to pay expenses. The Boers talk of re-establishing the gold laws; but in my opinion this is a mere ruse to put the diggers off their guard. I believe it is quite certain that the Volksraad will not ratify the concession promised to Mr. Gwyne Owen; at any rate, I have seen a letter this morning from the executive saying they would not. The discoveries of silver and gold near Pretoria are of no value so far as can be seen at present, and in my opinion they are never likely to pay.

With regard to the massacre of blacks in the Transvaal yesterday's Diamond News has the following, which will be of interest to one of your readers:—"A correspondent ('Thomasing' unfor date

May 4) has furnished us with the following information concerning affairs on the Northern Border. I beg to inform you that the Chief Mankoroane on his return to Taungs from interviewing the Commissioner at Barkly was attacked by a party of Boers and Gasibone's people, led by Raaf (brother of Commandant Raaf) and James Honey, who waylaid the chief at the drift on the Harts River, above Moehoeding; but were defeated by Mankoroane's people with a loss to the enemy of eight men, one of whom was a white man. The Boers are flocking to their laagers from the Transvaal and Free State. Within the last few days 150 Boers from the Free State crossed the border to join the freebooters, in addition to many young men from the fields, some of which are in receipt of Government pensions for services in Basutoland. I hear on good authority that the Landdrost of Christiana is taking an active part in assisting the rebels; also that there has been three affidavits taken before Major Lowe, of the Border Police, to the effect that the Transvaal authorities are aiding and abetting in this robbery and murder of the natives. Spies bring in reports that Taungs is to be surrounded, and men, women, and children are to be massacred on Tuesday next; that by taking that place the Battalings will then be scattered, and they (the Boers) will be masters of the country, and will then find their new Republic. I also understand that there will be several more affidavits laid against the Boers this week. Further information in a day or two"—Kimberley, May 5. CORRESPONDENT.

THE CHILE GOLD MINING COMPANY.

SIR.—The report of the above company, issued last week, is of such a disappointing character that I think it is deserving of some notice, and I trust you will afford me space in your valuable Journal for the following remarks upon it. From the floating of the company until now the shareholders have been buoyed up by the most lavish promises as to the splendid profits to be derived from this property, and a "good dividend" was actually assured for the first year; but what do we gather from the present report, and more particularly from the circular accompanying it? Nothing but complaints as to the wretched state of the mills and machinery, irregularities in the titles, great expense of working and carriage, inadequate supplies of wood and water, and so forth. All of which one would naturally expect the directors would have seen to before paying away about half a million of money, especially as very little of that money was their own, but entrusted to them on the faith of their statements, and in full belief in their business capacity and integrity. Instead of yielding a dividend I observe that in the half year ending December last, in order to earn about 6000l., no less than about 22,000l. had to be paid in working expenses at the mines alone, leaving out of account all the other expenditure. In fact, the output from the mine was not sufficient to pay the salaries and general expenses at Venezuela, which are not included in the 22,000l. mentioned above. In the face of these facts I do not wonder at the directors having to offer 10 per cent. for the 75,000l. debentures they now wish to raise, and give in pledge for that comparatively small sum the property, in which 500,000l. has been sunk, and embracing, as it does, one of the finest and largest gold lodes in the world, according to the managers' report. I am of opinion that the directors ought to have called a general meeting before taking any steps with regard to the issue of debentures, which will place ordinary shareholders at a disadvantage if the company should have to be wound-up eventually, as seems very likely to happen, judging by present appearances, and this point ought to be looked to by those interested. A SHAREHOLDER. May 31.

NOUVEAU MONDE COMPANY.

SIR.—If th's letter should meet the notice of any gentleman possessed of reliable information calculated to throw light on the present position of shareholders in this company he could hardly render them a more valuable service than by giving publicity to what he knows on the subject. A succession of blunders as unbusinesslike in their character as they have proved mischievous in their results has distinguished the so-called management of this company's affairs for close upon two years, and earned for it, it must be confessed, anything but an enviable reputation for capacity. Assurances from headquarters by official notifications in January, February, and June, 1881, were given to the effect that the purchase of the Nacupai Mines had been completed, and a transfer made, and later on shareholders were exhorted to exercise a little more patience until the commencement of the present year when the Gérant promised to call a general meeting, and submit a full account of affairs. That the mines are not the property of the company, as evidenced by possession, and that the Gérant's promise remains unfulfilled no one gifted with ordinary perception will attempt to deny. Apart from any question of legal responsibility for misleading statements what stronger proof could be afforded of the folly and mischief of treating as an accomplished fact what at best was only matter of negotiation (liable to failure in case of disagreement) than the bewildering confusion into which the whole concern has been allowed to drift? Rumours are afloat, and it is feared, not without reason, that a body of Parisian financiers have come forward to occupy the vacant ground, and have actually raised and remitted to Venezuela the balance of the purchase-money, the consequence of which would be to efface altogether this company, and render its shares valueless unless some previous arrangement had been entered into between the vendors and purchasers for securing in some adequate form the interests of Nouveau Monde shareholders against practical confiscation. If no such provision has been made it were better that the naked fact should be at once made known and realised, so as to put an end to an all but intolerable suspense, and at the same time prevent the continuance and further spread of unhealthy speculation. A SHAREHOLDER. May 29.

MINING IN SOUTH AUSTRALIA.

SIR.—As I before mentioned this colony has for the past six months been suffering from the severest drought ever experienced. Last night there was a good general rainfall, and everything may now be expected to revive. The gold mining interest especially has been very much retarded by the want of water, several mines not having sufficient to enable them to commence crushing the quartz, and some, as at Waukaringa, in the dry country, being barely able to get enough for drinking purposes. The Bird-in-Hand Gold Mine, which has been before alluded to, had a second crushing better than the first, equal to about 1½ oz. of gold to the ton of stone, the two crushings having given about 943 ozs. of melted gold, or (say) 3650l. worth within five months from starting the mine. A third crushing is now proceeding with promise of equally good returns. Quartz crushing is also going on at the Alma Battery, Waukaringa, but the water supply there is very deficient. However, the rain, if it has fallen in that neighbourhood, will help them greatly. New discoveries are continually being made, and there seems to be a fair prospect of a good and general revival in gold mining. One of the most recent discoveries is at Cudlee Creek, a locality about 20 miles in a direct line east from Adelaide. A private company have secured a lease for 50 years of 350 acres of land, and there are at least three gold-bearing reefs on the property. Alluvial gold has also been found on the same ground in a limited area between the hills. The quartz on being roughly crushed by a pestle and mortar and washed shows a very good proportion of gold, probably 1½ to 2 oz. of gold to the ton of stone. Other fresh discoveries are announced in the Echunga district—one of the oldest gold fields in the colony—and now the rain has begun we may expect very soon to hear of further developments. The Echunga Mining Company has just commenced crushing, and their prospects are decidedly good. The Lady Alice Mine, at Barossa, which some years ago did well, is being re-worked and looks better than ever. Several new reefs are being opened between Blumberg and Mount Pleasant, from 30 to 35 miles north-east from Adelaide, and some rich finds are reported. A rich tin discovery is reported near Encounter Bay, and another about 25 miles north of Waukaringa. Some splendid copper lodes have been opened near the present terminus of the Great Northern Railway, 200 miles from Port Augusta, the ore assaying from 35 to 40 per cent. of pure copper. A large area of land has been secured from the Government to the north of the Moonta Mines, and it is not unlikely that

English capitalists may have the offer of a share in it. On the whole our mining prospects are certainly looking up. J. B. A. Adelaide, April 22.

NEW QUEBRADA COMPANY.

SIR.—Your correspondent "T. G. W." ought to know that it is now too late to alter the agreement between the Bolivar Railway and this company, if it were not so the most unfair condition is—that though the railway charges over 20 times as much per mile for carriage as our English railways, the firm who promoted the railway receives 5 per cent. royalty on the gross (not net) production of the mine, which for 1881 would alone have paid 3 per cent. on the mine capital. The remarks made as to the present direction are more to the point, but what can one expect from a Chairman who is on over a dozen boards? The fees in this company are small, and I dare say the attention paid is fully commensurate to money received.

One transaction will require some explanation. It is reported that lately a third of the year's produce of ore and regulus was sold at once, from 12s. 6d. to 13s. per unit; a few days after Chili bars rose so much that at least a shilling more would have been obtained, which would have made a difference of 4500l. "Want of business ability" is a mild term for such a transaction, as everyone in the metal market anticipated a rise, or at least would not have then made forward sales to that extent. In 1880 over double that quantity was sold in June to any other month, and, strange coincidence, at the lowest price of the year. No doubt all the rest of the company's affairs are managed in the same way. What hope is there with such management? A committee of inspection ought to be appointed.—Clifton, May 31. E. J.

COAL TRANSPORT.

SIR.—In justification of my premises in treating this important subject, and with the view of carrying conviction to your numerous readers, in a more particular manner to coalowners, bankers, and miners, permit me to invite attention to the following results attainable by my system. I base the cost of material as supplied by the oldest and most important maker in the speciality of traction engines, with an excess in their cost of working same, thoroughly conversant as they are with the topography of the country to be traversed. An average distance of 30 miles is computed from the developed Barnsley bed, Silkstone, and Stanley Main Collieries to the riverain shipping stages daily accessible by ocean steamers at the reglementary minimum speed of four miles an hour as per 1861, 1865, and 1878 Acts of Parliament. In lieu of such rate of speed upon unfrequented country roads as those in question upon which minimum speed I have based my outcome, an accelerated speed is the rule, thus augmenting the number of trips, and consequently reducing the cost of transport, which in addition will be reduced very considerably by return load of wood to the collieries and centres of consumption—

Cost of traction engine, 16 horse power.....	£800
Four 10 ton trucks, 75l. each	300
Relay of ditto	300
	£1400
Repairs, 5 per cent. per annum	£70
Redemption, 5 per cent. per annum	70
Dividend, 10 per cent. per annum	140
Fuel, 1 ton per diem	86
Driver	104
Stoker	52
Advance man	52
Double shift.....	208
Two men in charge of trucks	101
Engine stores	114
	£1000

52 weeks × 320 tons, 16,640 tons 1s. 2½d. per ton at a reduced rate of speed, amounting in cost of conveyance from the pit to on board the ocean steamer to a trifle in excess of one-third of the 2s. 7d. per ton, plus 6d. per ton wagon hire rate proposed by the Hull, Barnsley, and West Riding Junction Railway and Dock Company, as per the evidence before the Select Committee of the House of Commons on June 9, 1880, of the chief promoter, whose shares whilst the line is as yet only under construction have gone down from 4l. paid up per share to 16s. per share—the much vaunted coal line to Hull. The agent of the South Yorkshire Steam Coalowners' Association stated in evidence on the same bill that the existing rate is 3s. 1d., plus 6d. wagon hire to Hull. If to the land lead we add the cost of sea transport with delivery charges to customers' premises in the Metropolis we arrive at a saving of upwards of 5s. a ton, on Tyne port at 3s. 10d. per ton freight, and at upwards of 6s. a ton on Great Northern Railway transit; in all cases with attendant delivery charges, the detailed items of which are too voluminous for recapitulation, but which are open to the most searching scrutiny.

The unworked coal field between Rotherham and Bawtry amounts, according to the report of a leading Yorkshire coal mining engineering firm, to five hundred million tons within 20 miles of the Trent, daily accessible with the tidal flow by proposed steamers, is offered an immense boon by proposed system by far surpassing any advantage offered by the projected railways from Rotherham to Bawtry and Trent. There is no limit to the extent of transport of coal by traction engines far surpassing in economy transit by rail. The relay system with double shift ensures dispatch, so essential to cheap transport effecting the shipment of coal for distances of 30 miles, and less upon infinitely more advantageous terms than levied by railway companies for short distances especially, and so deserving the energetic support and co-operation of all Royalty and colliery owners and bankers in the coal districts. As a case in point I have just received a letter from a coalowner stating he is charged by a railway company for 12 miles lead from his pits to shipping port 1s. 8d. a ton, which by proposed system can be effected inclusive of 10 per cent. dividend for less than one quarter of such amount.

The ordinary driving and steering wheels, as well as the wheels of the coal wagons, will be substituted by my patent endless railway wheels, ensuring a minimum friction, and by reason of a flat broad surface occupying a large area perfectly free from injuring the road. The wheels running upon a steel rail inside of the outer double rim or tyre the bite of the engine and of the trucks annihilates all slide or slip. This description of wheel presents no novelty, having been thoroughly worked. Indeed if we refer to evidence before a Select Committee of the House of Commons in 1859 on the Boydell traction engine and endless railway, made by the prected manufacturers, we shall at once discover a perfect analogy of principle. The peculiarities of the Boydell wheels consisted in the shoes forming the endless railway attached to the drawing and driving wheels, and revolving with them. The superiority of my system consists as stated in an outer tyre with a steel rail attached for the inner wheel to revolve upon, not liable as in the complicated Boydell wheels to frequent repairs, from which my system is exempt. W. J. THOMPSON.

Little Tower-street, June 1.

MINING LEASES.

SIR.—It seems to me to be a matter for surprise that after so many years as have passed in the experience of mining that so many absurd facts have been permitted to exist. In the first place there is the charge for the lease, varying from 25 to 30 guineas; and where, as is the case in some mines, a half-a-dozen lords are concerned, there are as many leases to be paid for. This is a serious tax on the miner, which ought not to be. A lease ought not to cost more than 10 guineas, and all the lords should concur in granting by the same deed.—2. There is the charge for land destroyed, in most cases 100/- per acre, where it is not worth 20/- per acre, and when paid for it does not become the property of the miner, but remains the landlord's still.—3. The dead or minimum rent is too high in many cases.—4. All the buildings, which in cases cost 1000l., are all claimed by the landlord under covenants in the lease, who pays nothing for them. This is almost as bad as iniquity itself, and is based on covetousness. The houses having been built at the expense of the miner, should be his, for sale or otherwise, upon the cessation of the works in the mine. And lastly, there is the question of dues. In mines

of a speculative character, as tin, copper, and lead mines usually are, no dues should be charged before the returns have covered all the expenditure in the works. After that the dues, or "rent," as it is now called, should be charged on the profits made, which, of course, should be a little higher than that charged in the leases at present.

The lords of mining property have not shown that liberality to their mining tenants which they deserve. Instead of encouraging the development of their land, they act quite the contrary, by unreasonable terms and restrictions which ought not to exist. I hope that the time will come when landowners will become friends to miners by granting leases upon conditions more consistent with reason than those now under observation.

R. S.

Truro, May 31.

NOBEL'S BLASTING GELATINE.

SIR.—In an article inserted in the Melbourne Argus of April 12, the following observation occurs:—"About two months ago a large quantity of dangerous explosive was landed in the colony, and the Government were at considerable expense in following it up in various parts of the colony, and having it destroyed." In another part of the article it is stated—"Mr. Newbury, Inspector of Explosives, had recommended that Nobel's Blasting Gelatine, as at present known, should not be admitted during the summer months." As the Melbourne Cabinet has decided to carry out the recommendation made by Mr. Newbury, it is evident that they hold gelatine to be a dangerous and unsafe nitro-glycerine compound.

K.

GREAT EAST VOR, &c.

SIR.—A paragraph in last week's Journal intimated the desirability of some information as to the number of persons employed, and work done in Great East Vor. To satisfy the enquirers I may state that there are seven men employed underground in this mine, besides the men engaged in drawing the tinstone by horse power to surface and carting it to Binner stamps, where it is being reduced and manipulated for the smelters. Of course there are several persons employed in that work, which I witnessed last week. This stamp was taken and Roseladden stamps abandoned because of the loss of the tin which was sustained there, and by which the proprietors have lost by estimation about 200*l.* Now that the reduction works are in the hands of honest persons it is expected that regular returns of tin ore will be made in such quantities as to stop the pens of antagonistic writers in the Journal.

The proprietors of Great East Vor have another mine between that mine and Wheal Vor called North Metal, where they have a rotary engine of 32*h.p.* cylinder, lately purchased from Messrs. Harvey and Co., which is about to be employed for pumping and stamping. At this mine there are 15 men employed, including a smith, a carpenter, and other labourers engaged in preparing the engine for working. There is to be constructed a tramway from Great East Vor and another from New Great Wheal Vor to the engine for the transit of the tinstone from both mines, of which it is known there is a large supply. I saw at each of the mines large heaps of tinstone waiting for reduction.

No blame should be attached to the manager of these mines on the ground of the limited underground operations, because having so recently commenced operations (nine months ago), it would be absurd to expect that there would be room for the employment of a large staff of miners, where the ground has to be opened. The manager is proceeding with caution and reasonable economy, and additional hands will be put on as soon as the circumstances of the mine justify it. He has shown his regard for economy by abstaining from the erection of account-houses up to this time, but in due course all the wanted houses will be erected.

North Metal was a portion of Wheal Vor United Mines during the existence of the old company, who realized 272,000*l.* profit from the lodes which pass through North Metal and Great East Vor. I see no reason why the same lodes should not be found as productive in these mines as they were in Wheal Vor; and the fact that tinstone of high produce is now being taken from Wheal Vor main lode in Great East Vor strengthens such belief.

Some of the best mine agents in the Helston district have reported favourably on these mines—Capt. Prisk, the manager of Phoenix United Mines, and of other mines; Mr. Johns, the local Duchy agent; Capt. Ridington, &c.

Truro, May 31.

CORNISH MINING.

SIR.—It may be presumed that Cornish mines are chiefly carried on under one of two systems—namely, the Cost-book and the Limited Liability, and it may be more particularly noticed under the management of London secretaries and directors, whose experience and practical knowledge of mining with few exceptions are entirely nil; not that I have any reason to complain of their business habits or their theoretical knowledge in general, but it is the rule and not the exception that their incapacity to deal with the more vital points touching the success of all mining speculations is so glaring that the outside public are hardly induced to take shares in some of the most legitimate undertakings that can be offered to the investor. It is perfectly known to practical miners that there is in the county great and very important mineral properties yet to be developed, and unsurpassed by any of the so-called mines in any foreign country, yet you will see hundreds of thousands of pounds of English money invested by the public for those mines under the same kind of management and directorate as the Cornish mines. And why is this? Because the concessions or grants can be easily obtained on more favourable terms, which gives an impetus to promoters in general to deal in the best market in which they can obtain terms so satisfactory that the hard cash of this country is lavishly spent for the benefit of those nations to the great detriment of our own native industries. I would recommend all persons interested in mining, more especially those before named and as subjects of this realm, to enforce their claims on the good judgment of the British landlords, and ascertain whether or no the same privileges cannot be obtained for and enjoyed by the investing public as in foreign countries, and if not by suasion then agitate for legislation to secure the privileges which the landlords are withholding from and to the great disadvantage of the working man and the community in general. The farmers of Cornwall have been bold enough to face the supposed inevitable and demand their legitimate rights, such as the abolition of restrictive covenants in leases and the law of distress, no doubt the retention of which has caused agricultural depression and forced into prominence the dissatisfaction so ripe throughout the United Kingdom, and I am convinced these provisions have innumerable cases turned distress into an engine of private revenge, tenants outraged, and the powers that be entirely inadequate and powerless to recompense the tenant for the loss and his ruined prospects in his own country. The mineral properties in this county are held chiefly by lords of considerable means and influence, and their stewards in general may be classified as belonging to that highly favoured class, the lawyers, who first business is as a rule to inform the applicant of a tack note that his fees are so much, not a trifling sum, and the usual covenants—namely, minimum rent, dues, or royalty, surface damage, deposit to insure payment, sum to be expended in machinery, continuous working, and a host of others of great antiquity, and usually last on breach of all or any restraint and re-entry, is it to be wondered at that the enormous amount of capital employed in the development of mineral properties should find its way to other and more generous climes, the arbitrary nature of such restrictive covenants and the ill-regulated manner of the proceedings leads to great hardship. It is against reason, and one and all should forthwith raise his voice against this great wrong. These primitive covenants should be abolished, and the landlord should not under any pretence be allowed to withhold his consent to search for minerals on payment of fair and proper surface damage estimated at its agricultural or grazing value, and not as at present at three and more frequently five times its worth. The law of distress allows a man to administer redress to himself, and not unfrequently the result is that the tenant or company as the case may be is entirely broken up to the great chagrin of innocent shareholders. The interest of shareholders and even the community require the full development of our mineral resources. What then can be more unwise than the land-

lords to maintain such primitive and demoralising laws? The chief argument that can be urged in its favour is agrandisement. Successful mining, and more especially in opening up new ones, requires the control of considerable capital, and surely the landlords ought to render all reasonable demands to promoters who risk so much valuable time and capital for the development of their mineral properties and the good of the community. Keep the promoters and companies cramped in the bonds of this antiquated privilege they will be unable to sustain the pressure of competition from all parts of the world which they have now to encounter. None have greater interest in these facts than the landowner. The abolition of such covenants which tend to impede the legitimate progress in mining cannot fail to conduce to the true interests of all persons connected therewith.

To sum up the question in a few words, it is desirable that all promoters, directors, secretaries, and others, should seek to rectify the first cause of failure by persisting against all unreasonable and illegitimate conditions imposed by the landlords which would induce to the true interest of all classes connected with mining in Cornwall and throughout the United Kingdom generally.

B. S.

London, May 25.

BELL VEAN MINE.

SIR.—I would be astonished at the temerity of Mr. David Burns attempting to prove the success of the machinery at the above mine did I not know that in his ideas he much resembles the famed Don Quixote. In his notice of May 13 he characterised the results of Tuesday's trial as "most satisfactory," and in his letter of last week he admits "they were not first-class." Wide as these statements are from each other they are yet wider from the actual result, the true nature of which may be inferred from the fact that the company has been brought to a standstill till stamps, or other supplementary machinery, be erected to reduce the tinstone to a washable size. The trial of Saturday differed from that of Tuesday, only in so far that the tinstone was passed through a third set of rolls, the result being no better than on Tuesday. Should any of my fellow-shareholders desire it I will send him a sample of Saturday's produce exactly as it passed through all the crushing machinery, so that he may see for himself that the rolls are hopelessly unable to "reduce tinstone to a fine powder," though represented to be capable of doing so in Mr. D. Burns's printed report to the shareholders at their meeting of Feb. 6 last. The fate of the Bell Vein Mine is another instance of how a valuable property may be lost through a theorist being permitted to be at the head of affairs.

Glazegone, May 31.

STEPHEN YOUNG.

ANDERTON TIN MINE.

SIR.—May I ask the favour of a short space in next week's Journal for a few notes of a visit I paid to Anderton Tin Mine day or two since? I was courteously received by the resident manager, and in his company made a thorough inspection of the underground workings. There is no doubt whatever that this mine contains one of the richest, if not the very richest, tin lode in either Devon or Cornwall, and for the depth at which it is being wrought (25 fathoms below surface) is producing a most marvellous quantity of fine tin. The lode is 12 ft. big, and impregnated with mineral from wall to wall, the country also between this lode and Rixhill lode, which is a few fathoms to the north, and underlying towards it, and will form a junction about 6 to 8 fathoms below present level, seems, so to speak, thoroughly saturated with tin, and the stuff will pay well for water stamping. I saw the broken from the lode, brought it to surface, and had it tested before my own eyes, with the result of showing over 8 cwt.s. of tin to the ton of stuff. I have some specimens taken promiscuously from large blocks which will show even a better analysis than this. The proprietors (there are but two) deserve all the success they have obtained, and a great success it indisputably is: for I question whether any other gentlemen would have stuck to the concern as they have, after the opposition of every kind thrown in their way. The working expenses are comparatively light, therefore the profit will be large. Should it be decided to form a company to more largely develop this property, I would strongly advise the public not to lose the chance of joining it and so getting into a sound legitimate investment.

J. C.

Exeter, May 29.

NORTH CORNWALL RAILWAY.

SIR.—The inhabitants of Cornwall, particularly those of the northern portion of the county, may be congratulated on the prospect now before them of a railway to connect Padstow with Launceston and the narrow gauge system. The want of such a line has been long felt, because that part of Cornwall is entirely destitute of railway accommodation. Besides that, there is a great necessity for a railway whose proprietors will show more liberality to the travelling and mercantile public than those of the Great Western, who are considered the most selfish in England, and whose charges for the transit of the produce of West Cornwall are so excessive as almost to prohibit the production of potatoes, brocoli, &c., enormous quantities of which are raised in the Penzance district. I hope to see the narrow gauge completed to Truro, with running powers over the West Cornwall line. Then a competition will arise which will bring down the goods tariff to a fair scale. I find that, in one respect, the Great Western directors have recently improved their manners by permitting third class passengers to travel by every train—except the express—putting on a trifling charge beyond the penny per mile. This step ought to have been taken 20 years ago.

If, of the two lines projected to Newquay—this, and the one from the St. Dennis junction—only one can be had, I prefer this, although I should like to see the china-clay producers accommodated by such a connection.—*Truro, May 31.*

R. S.

REPORT FROM CORNWALL.

JUNE 1.—Holiday time is not exactly the time to see a recovery or advance in business, and as this Whitsuntide has been exceptionally fine, and entirely given up to enjoyment, there is still no definite change to note in the position of our mines. Still there is not wanting very clear evidence of steadily growing improvement consequent upon a more stable condition of the metal market, and as a rule very little black tin is selling, a substantial advance being in the ordinary course of events regarded as inevitable. As it is the "official" standards, so called, do not in any adequate way represent the actual position or prospects, and have very little attention paid them. Both for tin and for copper we look for substantially higher rates. Improvement in tin is indeed inevitable for the present conditions of supply, and we quite agree with Mr. Watson in the belief that copper will be materially influenced by the development of electric lighting. Here, however, we do not anticipate so rapid an advance. Though we have such an abundance of electric companies the actual development of electric lighting operation is quite in its infancy, and a good deal of disappointment is in store for too eager investors. There always are people who make haste to get rich, now plunging in mining generally, then in shady stocks, then in foreign gold mines, and now dabbling in electricity. The future, however, of electric lighting is assured nevertheless, and at no distant date, and mining them must benefit.

We regret to record the death of Capt. Simmons, of Liskeard, so long and well known and respected in connection with the mineral agency of the Duchy of Cornwall, who has passed away at a comparatively early age, when he had apparently many years of active and useful life yet before him. Active, energetic, and courteous in the discharge of his duties, he will be much missed in the important sphere of official life in which he moved.

Reports from individual mines generally are of a very satisfactory character, and show that we are in one of the periodical phases of improvement which seems to come over our mining operations. There is good hope that the Dividend List will be speedily and largely increased.

We gather from what Mr. Watson said at the Devon Consols account that ere long we may hope to see something done in the way of mine smelting with regard to copper. We have proved so often the desirability of tin mines undertaking their own reduction of ore

into metal, and so far without result, that the prospect seems almost hopeless. It will be strange, however, if copper should pioneer the way, for tin smelting by comparison is simplicity itself. However, this is a direction in which we have all to gain and nothing to lose.

The spring meeting of the Royal Institution of Cornwall has been held at Truro under the presidency of the Earl of Mount Edgcumbe, who in the course of his address referred to mining, and pointed out that good miners had now no difficulty whatever in obtaining employment and making a fair living. The papers read were of an unusually interesting character, and one or two deserve further notice than can now be given. Mr. R. Symons's, "On the late Mr. J. T. Treffry"; Mr. R. Pearce's, "On the Artificial Formation of Cuprite in Colorado, and on the Silver Deposits at Butte, Montana;" and Mr. Bryant's interesting explanation of a crazing mill and pounding stones from Camborne.

At the forthcoming Polytechnic Exhibition a special gold medal will be given to the exhibit of most eminent merit in either the department of mechanics, or electrical and special exhibits. Every effort is being made to make the jubilee a thorough success.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

JUNE 1.—Only a few mills and forges have got well to work. In many cases, however, one or two mills alone have started both in the northern and the southern divisions of Staffordshire. Few employers who have sheet or hoop mills but were complaining in Wolverhampton yesterday and in Birmingham to-day at the pertinacity with which their hands keep the Whitsun holidays. Sheets in particular prices are much less irregular than before the starting of the Sheetmakers' Association. Rates may now be regarded as 10*s.* in advance of the prior minimum. Hoops are slightly better on account of the United States, and the prospects have considerably improved by the labour difficulties at the American mills and forges. Common pigs are stronger this week. They have been shown to be capable of producing good steel in bars by the basic process. Such steel was shown in Birmingham to-day made from what is usually termed cinder iron. It had borne a good deal of punishment under the sledge hammer without displaying much suffering, and it had likewise been welded and bent at the weld, yet without fracture. The experiments will be continued. Some makers of iron of this sort were to-day asking as high as from 2*l.* up to 2*l.* 1*s.* 3*d.* and 2*l.* 2*s.* 6*d.* Quotations were stronger also because of recent considerable sales in descriptions of mill and forge requirements in the ensuing three months. Most of the descriptions have sold fairly well in the past nine days, and there were few vendors who did not ask slightly strengthened rates; but in actual business there was no change in native qualities. The medium kinds produced in Northampton and Leicester and Derbyshire were easy at from 50*s.* down to 47*s.* 6*d.* All-mine pigs were 3*l.* 5*s.* up to 3*l.* 10*s.*; Barrow hematites were quoted 3*l.* 7*s.* 6*d.*; Tredegar sorts were procurable at 3*l.* 5*s.*, and it was an open secret that Wigan pigs were to be had at 3*l.* Coal was not active, and prices of house coal sorts were weak.

The North Staffordshire trades are likely to benefit very considerably by a piece of good fortune which has been met with by the Hanley Colliery Company. On the 25th inst. the company reached the 10-ft. coal whilst sinking at a depth of 462 yards. The 10-ft. is the first of the valuable Bucknall seams. A little way below the 10-ft. will in all probability be found what are known as the lower seams of the North Staffordshire coal field. At present the company draw about 500 tons of fuel a day. Since the find arrangements have been made for the winning of 1000 tons a day. Even at that rate the colliery, it is said, would not be exhausted for 50 years. The prospective supply of native fuel as contrasted with fuel from other parts (as is largely the case at present) is causing manufacturers in the district to be glad, for they will no longer have to pay cost of carriage. On the 30th ult.—only four days after this find—the Hanley lost their Chairman by the death of Mr. T. C. Brown-Westhead, a commercial gentleman well-known throughout the Midlands.

The experiments at the works of the Patent Shaft and Axletrees Company, with a view to test the practicability of making steel from common Staffordshire iron, have been thus far successful. The converter which the company have placed at the service of the committee of ironmasters, assisted by Mr. Thomas, one of the inventors of the Thomas-Gilchrist method, having received its basic lining, a small charge of common pig has been melted in the cupola, and fed to the converter, and the blow set on. From one of the resulting ingots a bar of steel has been rolled 1*in.* broad and 1*½* *in.* thick. A section of this bar was put under a heavy sledge hammer and doubled up, yet without breaking. Another section of the same bar was broken and re-welded, and was then bent in the weld, but without showing any sign of fracture. If future experiments prove no less satisfactory, then the common irons of Staffordshire will have acquired additional value; while by its capability to make native steel the Black Country will be still further advantaged.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

JUNE 1.—The holidays, as usual, have led to but little work being done during the first half of the week, but this in the present state of trade generally has led to no inconvenience whatever. The iron trade has been of a moderate character, although there has been a larger output of pig at Staveley, Sheepbridge, Clay Cross, Stanton, and other places, but there are considerable stocks in hand. A good deal of pig is consumed at the foundries, Staveley being one of the largest in the kingdom and well known for and wide for pipes, pillars, and other specialities, whilst Clay Cross also does a good deal in the same line. Mining machinery, engines, drills, and other appliances for both coal and metalliferous purposes are now being turned out on a large scale at Chesterfield, some of them being patented by Mr. Schram, as well as jointly with Oliver and Co. (Limited). The steel rail works have been as busy as ever, but the removal from Dronfield is now only a question of time, seeing that their purchase by Cammell and Co. has been ratified, despite the efforts of Mr. Munster, who is about the largest shareholder, to have the question of purchase referred to a committee of shareholders. The Coal Trade has been more than usually quiet of late, and the miners are on short time, some of them getting scarcely four days a week, whilst there is some difficulty in disposing of what is being raised. To London the tonnage of latesent to the Metropolis from the leading collieries has been but moderate, and the prices received cannot leave a profit. Silkstone have been delivered at 20*s.* per ton, and other sorts at 17*s.* and 18*s.* per ton. When the carriage rate is taken into consideration, together with the other expenses, the pit charge must be very low indeed. Steam coal does not go off so well as it should do at this time of the year; and were it not for the many furnaces now in blast matters would be a great deal worse, seeing that in the Thick seam coal both the hards and softs have to be got together. There has not been such a good demand for engine coal, so many works having been closed at various places for two or three days consequent upon the Whitsuntide festivities. Not so much gas coal is now required, and the coke trade has been quiet.

In Sheffield not much work was done during the first half of the week, for the Sheffielder under any circumstances will take advantage of the holidays, and during the present year he has been able to make ample preparations for the full enjoyment of them. Trade has been good in almost every department, heavy and light, more especially in the former. The mills have been running well, for there are heavy orders in hand for plates of nearly every description, including those for vessels of war, composed of both iron and steel. More has also been done of late in steel plates for merchant vessels, for iron is being gradually but surely dispensed in favour of the other material. An improvement has also taken place as regards machinery for grinding minerals, as well as in that for coal washing. In lighter appliances a good business continues to be done in sheep-shears for exportation, as well as in edge tools, files, and saws. There has been a heavy output of Bessemer billets for various purposes, whilst rail makers absorb a large portion of what is made, for there is still a brisk demand for every description of railway material, although the prices are considerably below what they were in the

earlier part of the year. In general cutlery makers if not busy all round have been well employed, and a considerable business has been done in garden and agricultural implements of a light description. Some of the foundries have become busier, especially in stoves, grates, palisadings, and house furnishing, whilst pipes are slightly in better request. At Parkgate there has been a large make of pig, and the mills have been running well.

The coal trade of South Yorkshire is still in an unsatisfactory state, and at a meeting held in Sheffield of the colliery owners it was resolved to send a deputation to the directors of the railway companies requesting them to make a reduction in the carriage rate to London, more especially to the Metropolis. The question of a reduction of the rate from the West Riding would of necessity affect that from Derbyshire, which is so much nearer to the Metropolis, so that there are considerable difficulties in the way of making a reduction, which cannot be easily cleared away.

The practical use of the telephone in collieries is now being demonstrated in South Yorkshire. The apparatus has been adjusted at the Oaks and Manvers Main Collieries, and from the surface to the workings, over a mile apart, conversations can be carried on with remarkable distinctness. The state of the pits can be thus ascertained without any delay, and prompt measures taken to meet threatened danger.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

June 1.—A glance at the following brief summary of its mineral production for 1880 will show that the Principality of Wales is, for its size, one of the richest, if not the richest, portions of the earth's surface mineralogically. It produced in that year:—Copper ore, 6321 tons, value 20,502*l.*; lead ore, 20,594 tons, value 209,594*l.*; zinc ore, 12,920 tons, value 49,021*l.*; iron pyrites, 431 tons, 216*l.*; gold, 5 oz., value 20*l.*; nickel and cobalt ore, 49 tons, value 287*l.*; manganese, 101 tons, value 192*l.*; ochre, 2178 tons, value 2782*l.*; iron ore, not derived from coal mines, 67,170 tons, value 37,411*l.*; iron ore, derived from coal mines, 279,714 tons, value 159,887*l.*; coal, 18,660,550 tons, value 7,000,000*l.*; slates, estimated, 1,250,000*l.*; lime and limestone, estimated, 1,000,000*l.*; paving sets, building stones, &c., estimated, 500,000*l.*; barytes, 481 tons, value 372*l.*; making a total value of the mineral productions of the Principality of 10,030,300*l.* A noticeable feature of this mineral production lies in its great variety, a feature which is, of course, dependent on the variety of geological formations there is in Wales. The lead ore of the Principality yielded a total of 116,978 oz. of silver. The county producing the most being Cardigan, 49,445 oz.; Montgomery following with a yield of 28,964 oz.; next in order come Flintshire, Carnarvonshire, Pembrokeshire, Denbigh, and Carmarthen. The mine whose ore was richest in silver in Wales, indeed in the whole of the British Isles, was Court Grange, Cardigan, with a yield of nearly 36 oz. to the ton of lead; followed by South Darren, in the same county, with a yield of 33 oz. to the ton. Cardiganshire stands at the head for the proportion, 82 oz. to the ton; Montgomeryshire, 7 oz.; Flintshire, 6*1*/₂ oz.; Denbighshire, 5*1*/₂ oz.; and Pembrokeshire, 4 oz.—the Van Mine in Montgomeryshire yielding 12 oz.

The colliers' strike is breaking up, with spasmodic throes of attempted violence—the men at several collieries have gone in on various arrangements, chiefly a reduction.

TRADE OF THE TYNE AND WEAR.

May 31.—There is no change to notice in the state of the Coal and Coke Trades; on the whole the collieries in Northumberland and Durham, with some exceptions, continue to be fairly employed. The competition of the Tyne and Wear with other coal fields and districts has prevented any rise in prices of late. A good supply of large steamers which come to these rivers enables the colliery owners and coal merchants to compete with other districts, but the struggle is pretty severe for the trade to the Mediterranean and South-East generally.

The pig-iron trade has this week preserved a firm and steady tone, and prices have not fluctuated to any great extent. Both makers and merchants are firm in their quotations. The "bears," however, still make their operations felt. The stocks of Messrs. Connal have been largely drawn in the month, and the return is expected to show a greater decrease than for any month in the holding of warrants. The shipments this month have not been large. The steel trade continues good. The price of steel rails is now below that of iron rails. There is no change in the price of raw or manufactured iron, although the trade is steady and firm in all branches. At Middlesborough, on Tuesday, the attendance was extremely limited, owing to the holidays. The feeling, however, was very firm and steady. The makers are now evidently masters of the situation, as they hold nearly all the iron not in store. They have sold nearly 11,000 tons of iron since last Tuesday. No. 3 remains at 43*s.* 3*d.* Messrs. Connal's stock is now 136,119 tons, a reduction of 241 tons in the week. The export trade in iron has been fair; last week they amounted to 16,231 tons. A large portion of this was for the Baltic ports. There was also exported over 8000 tons of manufactured iron and steel. A large delivery of steel rails was made for India. The demand for steel rails is not very good at present. Iron shipbuilders appear to be confident as to the future, as they are in many cases enlarging their works. Marine engine builders are also increasing their powers of production. There is no change in the quotations for any kind of manufactured iron.

The inquest on the men killed by the explosion at the Tudehope Colliery was closed on Wednesday. Mr. Johnson, the manager, was examined at great length by Mr. Bowey. He stated it to be his opinion that the fall in No. 6 way west pit was the seat of the explosion, and caused it, the fall having liberated a quantity of gas and forced the flame through the lamp. This opinion he adhered to, although Mr. Bowey elicited that several men were found under this fall, and that these men were severely burned, and he suggested that the men must have been burnt previously to the occurrence of the fall. Mr. Douglas, manager at Messrs. Pease's collieries, and several other viewers were examined, and they all agreed with the opinion of Mr. Johnson as to the cause and seat of the explosion. The verdict of the jury was to the effect that the explosion was caused by the fall alluded to, and the deaths of the men accidental.

The adjourned inquest on the men killed by the Stanley explosion was resumed on Saturday. Several mining engineers and viewers were examined, and gave their evidence as to the cause and seat of the explosion, Mr. G. B. Forster being one of the number. All those gentlemen concurred in the opinion that the explosion occurred in the face of the east bord, in the north district. That a sudden blower of gas had come off, and by some means the flame had been forced through the lamp gauze. Mr. Indian, a miner, held a different opinion. He examined the workings after the explosion, and formed the opinion that it occurred in the south cross-cut district. Some small troubles occurred at this point, and the gas was given off at these, and the gas was, in his opinion, fired by a shot. John Thompson, a hewer, was of the same opinion as Indian, that the explosion had occurred in the south cross-cut way. The verdict of the jury amounted to one of accidental death, and they also found that the Bustyle seam was in fair working order.

The late explosion in the Durham mines prove conclusively that it is very difficult in many of these extensive works to keep the workings in all parts clear of explosive mixtures. The workings are very extensive and the ramifications numerous, and in spite of all the late great improvements effected in ventilating mines, it is clear that the task of keeping the bords and leading places in whole workings on the pillar and stall system is a difficult one, and in pillar working the task is no doubt equally difficult, while it is, perhaps, practically impossible to keep the goaves free from accumulations of these dangerous mixtures. When longwall work is carried out the system is no doubt less complicated, but explosions have occurred under both systems. One fact stands out very prominently in all the cases, that is the shot firing, which has been practised, and it is difficult to avoid the conclusion that some, if not all, of these explosions have originated from the firing of shots. It is, of course, difficult in these cases to fix on the exact seat of the explosion, yet there are indications, such as the direction the blast has taken, which

give some idea, yet the witnesses at the inquests often differ on this point. There are also different modes of firing shots; we have observed that in a late case when a shot was to be fired the place was examined for gas, and if found clear the lamp top was screwed off and the naked light was exposed and applied to the match to ignite the fuse or straw which was to fire the shot; this appears to be a system in which unnecessary risk is incurred. In our experience shot-firing was done by means of a wire; this wire was put through the meshes of the Davy gauze and heated at the flame of the lamp, and afterwards applied to the fuse which was to ignite the shot, this certainly appears preferable to exposing the naked light. Of course, if gas were present the explosion of the shot might explode it, but some mining engineers have held that this did not often occur. It appears that if coal mines have to be worked under the present conditions shot firing must either be entirely relinquished or confined within very narrow limits, and only allowed under the most strict supervision. If other means can be found to bring down the coal or stone without using gunpowder, these means ought certainly to be adopted, and if this has not been already effected it appears to be probable that it will soon be accomplished. If these explosions, or some of them, have occurred from the Davy or Clanny lamps the sooner these lamps are discarded the better, and superior lamps adopted in their place.

TRADE IN SOUTH WALES.

June 1.—The steam coal trade at the principal South Wales ports remains in full activity, and prices have a tendency upwards. Cardiff has sent away since last week 129,005 tons foreign and 18,504 coastwise; Newport, 30,738 tons foreign and 18,669 coastwise; Swansea, 19,923 tons foreign and 12,038 coastwise. The patent fuel trade is also in an excellent condition. From Cardiff 2770 tons have been exported, and 2442 tons from Swansea. The pitwood trade is active, and the freight market is better. In Swansea valley some of the iron and steel works are in full swing. The great steel works at Llanidloes are executing some large orders for the Government, while at Birchgrove they are working with regularity. The zinc and spelter works in this district are also fairly employed. Iron ore is coming in in fair quantities. At Cardiff 11,333 tons have been received from Bilbao, and 2882 from other places; at Newport 10,880 tons have been received from Bilbao, and 1649 from other places. The price remains at about 16*s.* per ton. Another failure is announced in the tin-plate trade—that of Mr. Charles Morris, of Rhwiderir, with liabilities at about 15,000*l.* The price per box at Liverpool and London is about 15*s.* 6*d.* for coke-made, which is unremunerative. Notwithstanding the closing of about 20 works and the partial stoppage of others, prices have not yet risen to a paying point. That they will do so there can be no manner of doubt. Here is a constantly expanding trade ruined by the folly of manufacturers, who insist upon flooding the markets with their goods. All the smaller makers will now be driven out by the combination of the large makers, and in a few months we may expect to see trade again in a healthy state. The visits of the Bath and West of England Show and the A.M.C. of Oddfellows, the Foresters, and the opening of the New Free Library and Museum at Cardiff, have tended to the stoppage of work in the mines, but next week matters will fall into their normal groove.

The result of the Llwynypia experiments of the Royal Commission for the Prevention of Accidents in Mines has produced considerable disquietude in mining circles in South-west Lancashire. Up to a fortnight ago it was regarded that the Mueseler, or Belgian lamp, was the safest lamp in existence, and in several collieries in the Wigan district it was being introduced very extensively, but the South Wales tests have completely staggered the colliery proprietors, who are in want of a good lamp, but are at a loss where to find one. A Wigan gentleman who took part in the experiments, writing to the South Wales Daily News, says:—"The Mueseler lamp was exploded time after time at a low velocity; in fact, the lamp in its present state is very little safer than an ordinary Davy, and the Commissioners have a very difficult task before them in making their report." Mining engineers in South-west Lancashire naturally feel great anxiety on the subject, and desire the Commissioners to press forward with their experiments, so that they have data upon which to go in making a selection of a lamp for their mines. The Davy has been condemned, and they must be prepared very soon to substitute another for it.

THE PRINCIPAL APPLICATIONS OF ELECTRICITY.

The electric telegraph, electric illumination, the telephone, the phonograph, and so many other things which contribute to our daily wants and convenience, are constantly reminding us of our great indebtedness to electricity that almost everyone desires to know something of the history of the numerous practical applications of that mysterious fluid, and it would probably be difficult to mention any work from which the necessary information on the subject can be obtained superior to Hospitalier's, which is now rendered available to a larger number of Englishmen in the excellent translation and enlargement*, just completed by Dr. JULIUS MAIER, of Cheltenham College. The progress made in connection with improvements in the generation and application of electricity is now so rapid that it is almost impossible to keep thoroughly posted upon the various new inventions which each month bring forth without some means of systematically aiding the memory by carefully classifying the objects which inventors and discoverers have sought to attain, the principles upon which the several inventions have been based, and the facts which have been ascertained and recorded so as to be able to refer each new announcement to its proper place. Although scarcely more than a year has elapsed since the first edition of Hospitalier's book appeared, a second edition has already become necessary, and not only does Dr. Maier give all that is contained in the latter, but brings the record down to a still later date by giving the fullest details of the Edison, Lane-Fox, Brush, Pilsen-Joel, and other systems of lighting, of the new apparatus for indicating the presence of fire-damp in collieries, and the application of the electric light therein, and amongst many other things the electro-metallurgy of zinc and the rectification of alcohol by electricity.

The sources of electricity are first considered under the heads of electric batteries, thermo-electric batteries, electro-dynamic machines, and apparatus for transforming electricity, a classification which is fully justified by the remark that all the apparatus used till now for the production of an electric current can be divided into three large, perfectly distinct, classes characterised by the nature of the action which comes into play. First there is the apparatus in which chemical action is utilised, and which directly transforms chemical affinity into electricity; these are galvanic piles or galvanic batteries. Secondly, there are the apparatus which directly transform heat into electricity; these are thermo-electric batteries. Then there are the apparatus which directly transform work into electricity; these are electro-dynamic machines, which are subdivided into magneto-electric and dynamo-electric machines. And lastly, there are those electrical apparatus which are not properly speaking generators of electricity, but which impart to the electric current particular properties by changing its relative qualities. It is explained that the simplest form that can be given to a battery is that with a single liquid—a glass vessel, for example, containing water acidulated with one-tenth its weight of sulphuric acid, in which are immersed a zinc blade forming the negative pole of the battery, and a copper blade receiving by conduction the polarity to the liquid to form the positive pole. On connecting the unimmersed ends of the metallic blades by a wire an electric current is circulated going from the negative (zinc) to the positive (copper) pole through the liquid in the interior of the battery, and from the positive to the negative through the conducting wire outside. Passing over for the present the secondary phenomena produced in the interior of the battery the current circulating in the outside circuit may be examined.

* "The Modern Applications of Electricity." By E. Hospitalier. Translated and enlarged by JULIUS MAIER, Ph.D., Science Master, Cheltenham College. London: Kegan Paul, Trench, and Co., Paternoster-square.

water to circulate through a tube, and with regard to a given electric circulation there are three characteristic elements. First, there is the tension, called variously the pressure of the current, tension, electro-motive force or difference of the potentials; the force through which the electric current is established. Secondly, there is the volume of the current, its intensity, or the quantity of electricity traversing the circuit in a given time. And lastly, there is the resistance of the circuit, the resistance which the conductor opposes to the circulation of the current, taking into consideration its dimensions and its nature. Ohm's law, which connects the resistance of the conductor with the tension, and the intensity of the current in an electric circuit was established mathematically by Ohm in 1827, and experimentally by Pouillet:—It is the electro-motive force or tension divided by the resistance the quotient will be the intensity or quantity of current. Now, it is obvious that the necessity will frequently arise for expressing, in writing or speaking, the strength and character of different currents in order that they may be compared with each other, so that it is not surprising that it was soon found when electricity came to be practically applied, that units for electrical measurement were as necessary as units for the measurement of liquids, solids, or dimensions; but until 1863 nothing practical was done to obtain uniformity, and there was great confusion from each writer using an empirical unit, sometimes introduced by and known only to himself, when recording some experiment which he had made or a result obtained. In the year mentioned the British Association appointed a committee composed of the most eminent electricians of Great Britain to fix upon a standard of electrical measurement. After eight years labour the committee published their report, and a B.A. unit was introduced.

The units adopted by the English Commission were founded on the centimetre, the gramme, and the second. They are all derived from one another by definitions which present the advantage of clearly establishing these units, and allow of their being fixed anew in case it should be necessary. They possess, moreover, the still greater advantage that they require no other coefficients of reduction, but multiples of ten, and even these would have been unnecessary but that the original or "absolute" units were found rather too small for practice, so that decimal multiples, named after men celebrated in electrical science, were substituted. Hence the unit of resistance is the "ohm" (Ohm), which corresponds to the resistance of 100 metres of iron wire of 4 millimetres diameter. When the resistance is expressed in the French style of "kilometres of telegraph wire" the kilometre may be regarded as 10 ohms. The unit of tension or of electro-motive force is the "volt," which corresponds very nearly to the electro-motive force generated by one Daniell element, the exact value of the latter being 1.079 volt. There is no real standard for the volt, but its use is preferred to other units on account of the extent to which it simplifies calculation. The unit of intensity (the intensity being calculated according to Ohm's law) is the "ampere," which is a perfectly distinct quantity of electricity, as a litre is a definite volume, and a kilogramme an equally definite weight—the ampere indicates a determinate quantity of current of a determinate tension, which will pass through a point in a standard wire in one second. In telegraphic appliances where the intensities are very feeble the milliampere, which is the thousandth part of the ampere is always taken as unit. The currents employed in telegraphy vary between 5 and 10 milliampères, those which serve for the electric light vary between 1 and 50 ampères, and in certain electro-chemical operations the intensity of the current reaches 1000 ampères. The unit of quantity is the "coulomb," representing the quantity of electricity which traverses during one second a conductor of one ohm resistance, with a difference of potential of one volt. The unit of capacity is the "farad," representing the capacity of a condenser, which contains one coulomb of electricity when charged to the potential of one volt. In practice the farad is too large a quantity, and the unit actually adopted is the microfarad, which is the one-millionth of a farad. Thus there are five electrical quantities and five corresponding units—pressure or electro-motive force, expressed in volts; resistance of the conductors, in ohms; flow, volume, or intensity of the current, in ampères; quantity of electricity, in coulombs; and capacity of a condenser in microfarads.

It appears that Archereau first used prismatic carbon in the Grove's battery in 1849, placing this in the porous cell, while he placed rolled zinc in the outside vessel, so that the battery universally known as the Bunsen battery is really the invention of Archereau. Tommasi has modified the Bunsen battery with the idea of doing away with the nitrous vapours, and thus rendering the apparatus fit for electric lighting, but practical results are awaited. The chapter on thermo-electric batteries commences with an account of Seebeck's interesting experiment of 1821, and is brought down to the date of Clamond's thermo-electric battery heated with coke. With this battery two Serrin lamps, giving a light of from 500 to 750 candles each, can be supplied with electricity with the consumption of about 20 lbs. of coke per hour. But the chapter which at the present time will probably be read with greater interest than any in the book is that which succeeds and which treats of electrodynamic machines, with regard to which it is truly remarked that the transformation of work into electricity is the most complicated means of producing an electric current; and yet it is up to the present the most economical and the most extensively used of all applications which require powerful currents. This extensive employment of machines is of comparatively recent date, although the discovery of the fundamental principle of all machines was made by Faraday in 1830. All electro-dynamic machines are founded on Faraday's discovery and the laws of Lenz and Manteucci applied to practical methods for the most effective collection of induction currents. Every electro-dynamic machine—and this term includes both magneto-electric and dynamo-electric machines—consists of two fundamental necessary indispensable parts—the inductor and the armature. By moving the inductor before the armature, or, as a general rule, the armature before the inductor electric currents are produced in the wire of the armature, whose nature, intensity, and sense are defined by Lenz's laws. These laws show that in order to obtain powerful currents the armature must be moved with great velocity before powerful inductors. Any mechanical arrangement which enables us to obtain this result is an electro-dynamic machine. The function of the inductor is to create a special condition of movement of the surrounding ether, and this is called the magnetic field. This magnetic field can be produced by two very different methods, which are fully described, and according to these methods the machine will be a magneto-electric or a dynamo-electric machine. Another and more important division is based on the nature of the currents collected outside the machine on the external circuit; the machines will be classed as alternating current or continuous current machines accordingly.

Since the exhibition of Wilde and of Ladd's machines at the Paris Exhibition of 1867 the number of modifications introduced has been enormous, but scarcely any modification has been other than a mere improvement of some trifling detail, which although of the highest importance towards perfecting have given no justification for patenting any of the numerous modified machines as a new invention. The idea of employing a ring as a movable armature was carried out by Page, an American electrician, in 1852, and in 1861 Pacinotti constructed a motor which in principle was identical with Gramme's machine. In the present work the exact details of the various machines—including Gramme's, Niaudet's, Schuckerl's, Lontin's, Siemens's, the Wallace-Farmer, Brush's, and others—are given. Secondary batteries again appear to be much in the same position as dynamo-electric machines; all are based on Gaston Planté's element of 1860, and although Faure's, Sutton's, Houston and Thomson's, Varley, and others, have each produced storage batteries which are of the utmost value, each has but developed an already known principle, so that although each is entitled to the credit and profit of his ingenuity not one has a claim which shut others out of the field of invention in the same direction. The portions of the volume devoted to the consideration of electric lighting, of telephones and microphones, of the various applications of electricity of electrical transmission of force to a distance, of electric motors, and the distribution of electricity, are all equally comprehensive and interesting, whilst the admirable illustrations, which are very numerous through-

A special vote of thanks was passed to Capt. Drake, and a similar compliment having been accorded to the Chairman, directors, and secretary the proceedings terminated.

HINGSTON DOWN CONSOLS MINING COMPANY.

The general meeting of shareholders was held at the company's office, Queen-street-place, on Tuesday.

Mr. F. E. KEW in the chair.

Mr. JOHN ELPHICK (the secretary) read the notice convening the meeting.

The CHAIRMAN said that before proposing the adoption of the report and accounts he had a few remarks to make. The progress made at the mines had been very satisfactory and encouraging. Some good quality copper ore had been raised, and as soon as the dressing-floors were ready would be prepared for market. The costs were heavier, but this was accounted for by the increased amount of work. He would leave any explanation as to the present state and prospects of the mine to Mr. Taylor, who had lately visited the property.

Several questions were asked by the shareholders, to which Mr. TAYLOR answered that the ore raised from Nos. 1 and 2 lodes in driving the levels, and from a small amount of stoping was estimated by Captain Richards to make when dressed 35 tons, 18 tons of which will give 11 per cent. produce, and the other 17 tons will be something like 8 per cent. produce for copper, the whole being valued at 52 per ton. The appearance of the stuff from these lodes was certainly very encouraging; it was a very promising sort of ore, and the vein stone that is mixed with it is composed of minerals that are very favourable, and which accompany ore in other good mines in the district, very much like the stuff which was found in the old mine which was so rich. He had been asked whether if more money were called up at a time the results could be expedited in the mine, to which he would reply as he had distinctly done at former meetings, that the mine was one in which boring machinery might be very advantageously applied. There were few places at which it was more desirable, but as that would have involved a considerable outlay, the directors had hesitated to call upon the shareholders for the sum that would be necessary for the work.

The sinking of the shaft would certainly be hastened by having boring machinery, and a very important work which was now going on—that of driving the main adit level south towards the old mine—might also be very much expedited. It was well known with any certainty what lodes were lying between the present end of the adit level and the old mine, but there were surface indications which would lead one to think that there was one lode at least. The present end of the adit level was in very favourable ground for driving, and several small branches containing black ore had recently been met with; altogether Mr. Taylor looked upon it as a very important trial, one which he would like to see hastened on, but they could not do that without laying out money for providing the necessary boring machinery.

Mr. BLADON asked what sum he (Mr. Taylor) thought would be sufficient for the purpose, to which he replied that it would run into about 1000*£*. Mr. TAYLOR then went on to say that in other respects everything was going on vigorously. They had got a full force of men in the different levels, and all necessary preparations had been made during the past two months by cutting the plat and dividing the shaft for sinking it still deeper. They were now in a regular course of sinking, and he hoped and thought that they would make good speed, judging from the nature of the ground. He was at the mine a few weeks ago, and everything seemed to be going on very favourably. The preparations for dressing the ore had been of a very inexpensive nature so far; the levelling out of a place for the dressing-floors, and a little tramroad to it had been made, and a very nice looking pile of ore was in course of preparation. This had been found in course of driving the different levels with a little assistance from the stones in the back of the 12 on the No. 2 lode.

Mr. BLADON enquired whether the junction of the Nos. 1 and 2 lodes, which had been referred to by one of the shareholders, was that upon which he had founded his greatest expectations, and which had been spoken of at former meetings?—Mr. TAYLOR replied that the junction now alluded to was that which was expected to take place from the convergence of the two lodes in going eastward, whereas Mr. Bladon had in view that which would take place before coming together at a greater depth from the difference in their underlie, and which it was assumed would be at a depth of 40 or 50 fms. He continued that there was very reasonable ground for hoping that before such depth was reached, and when the 25 fm. level came under the bunch of ore that was met with in the 12 they might find something good.

Mr. ROSEWARNE considered that a very interesting point, and from what he had seen at the mine he was of opinion that things would improve as they got deeper. The work would, he thought, be greatly facilitated if they were to use boring machinery.

The CHAIRMAN said the directors would not hesitate to make a larger call if Messrs. Taylor, the managers, advised it.

A SHAREHOLDER asked as to the dressing machinery?—The CHAIRMAN replied that when all was completed they would be able to treat a large quantity of stuff. It was proposed by the CHAIRMAN, seconded by Mr. BLADON, and carried unanimously.—That the report of the directors, together with the audited accounts, be received and adopted.

The following resolution was also passed unanimously:—"That Messrs. H. P. Hall, Edgar Figgess, and F. E. Kew, be re-elected directors of the company for the ensuing year. That Mr. James Waddell be re-elected auditor of the company for the ensuing year."

A vote of thanks to the Chairman terminated the proceedings.

THE MONA MINES.

The annual general meeting of shareholders was held on Thursday at the offices, Dashwood House, New Broad-street.

Mr. WM. BRUCE DICK in the chair.

Mr. W. J. LAVINGTON (the secretary) having read the notice convening the meeting.

The CHAIRMAN said that one of the directors, Mr. Hunter, sent down Capt. Ben Williams to Mona at his own expense two weeks ago, and had a report prepared on the mines for his own special benefit. That report was received the day before yesterday, and he thought it would be very satisfactory to the shareholders to hear it.

Mr. LAVINGTON then read the report referred to.

The CHAIRMAN continued that they would all agree that that was a very satisfactory report on the mine. In addition to that, they had obtained a report from Capt. Evans.

Mr. LAVINGTON also read the report of Mr. Evans.

The CHAIRMAN said that at the last meeting they had a report made upon these mines by Capt. Kitto, who complained of the un-business-like manner in which the operations of the mine were conducted, and that was prominently brought before Mr. Evans, who quite concurred in the statement that too much under stoping was being carried on, and instructions were given to Mr. Evans to put the mine into a thoroughly efficient working state, and to do away with the under stoping as soon as possible. Mr. Evans during the time that had elapsed had done that to the utmost of his ability. It was not to be expected while he was doing that that they could be making much money. They had held their own, he was glad to say, and he might state also, and he stated it in all sincerity, for he had taken a great interest in the mine, and had been down to it twice and done his utmost in looking after affairs, he felt satisfied the mine at the present moment was in a much more valuable condition than it had been in for many years. He moved that the report and accounts be received and adopted.

Mr. SINCLAIR seconded the motion.

A SHAREHOLDER asked why a dividend of 10*s*. per share was declared on a previous occasion? When the mine was not in a proper state there was a dividend paid, he contended, when the mine ought to have had the money laid out upon it in developing it in a proper manner. It appeared to him that it was done with the view to rig the shares and enable some people to get rid of their shares, and some poor fools bought them.

The CHAIRMAN said the question had been asked why the dividend of 10*s*. per share had been paid, and it had been stated that it had been done for the purpose of rigging the market.—The SHAREHOLDER: It appears so.

The CHAIRMAN continued: The hon. shareholder would be surprised when he stated that the effect that the payment of the dividend had upon the shares was not. If they could refer to the price current of May in the market, which any person could see, they would find in the month of February they were selling at 13*s*. and 14*s*. and the price remained at 13*s*. 14*s*. 15*s*. and 16*s*. right away on till after the dividend was declared. The dividend was declared on July 1, and was paid at the end of July, and they would also find from August to December the shares were really at the same price, and the payment of the dividend had really no effect on them.

The SHAREHOLDER: Was that dividend paid out of revenue?—The CHAIRMAN: It was, Sir. At the time that that dividend was declared they had in actual cash 47*s*. received on account of sales of produce. At the time they were justified in declaring the dividend. No doubt difficulties occurred afterwards, and they were disappointed with their bluestone. They had a lucrative contract with a firm in Belgium, and sent two cargoes; they got returns from those two cargoes which were of a most satisfactory nature, and they never anticipated that the balance of the bluestone was not of the same quality and character until the assays came. Those turned out inferior, and that reduced their revenue. If the value of the bluestone had continued the same as at first they would have paid another dividend. It was the falling off in the bluestone and the value of speleer that caused the absence of a dividend, matters for which the directors could not be held responsible. The contract with the Belgian people was to deliver a certain quantity of bluestone, and they would be very happy to receive it if the company could supply it.

Mr. SINCLAIR said they had an important contract with people in Belgium, and if it had not been for the sudden drop in zinc in August and September, and the falling off in the value of bluestone they would have had splendid results.

The CHAIRMAN remarked that they were paid according to the value of the bluestone.

Mr. BATTERS thought the explanation had better come from Mr. Evans. The contract was a sliding scale contract, dependent on the price of metal and percentage of the metal in the ore.

Mr. EVANS said that the two or three first cargoes turned out remarkably well, and they got very good prices, but in the next cargo that was sent they were disappointed in the quality. Subsequent shipments had also turned out of inferior quality. The contract was made before he took the management. The contract made the price payable determinable by a complicated formula, and that formula was so constructed that when a slight falling off took place in the market or the mineral the produce became of almost no value at all. In fact one cargo sent hardly paid the cost of raising and freight.

The CHAIRMAN, in reply to further questions, said the contract was introduced by Mr. Batters, and was made in the usual way through brokers—Messrs. Norris

and Carter. Mr. Batters brought the transaction before the board and it was sanctioned.

Mr. BATTERS thought the meeting was labouring under a wrong impression with regard to this contract. He did not think that this contract had anything to do, or very little to do, with the results of the balance-sheets. The contract for a certain quantity of bluestone, was based upon the bluestone yielding a certain percentage of zinc and upon a certain percentage of lead and silver, and upon the price in the market at the time it was made it was considered by all, the directors and everyone concerned, as being very valuable contract. A certain quantity of ore was delivered and paid for, resulting in a very high return to the company, a price which he thought had never hitherto been realised in the history of the mine, and it looked as if the company had entered upon a new era of commercial existence from bluestone alone. They must not blame the contract for subsequent events, as the yield of bluestone fell off in the most remarkable manner. The quantity which the directors were led to expect would be turned out was not turned out. Metallurgy was better understood on the Continent than here. That contract was consequently looked upon as a good thing. However, the contract was not a material factor in the accounts presented. He would ask Mr. Evans the cause of their not having agreed to take the produce at a fixed price, the deliveries to go off the number of tons contracted for.

Mr. BENNET expressed the opinion that 30*s*. a ton was as much as could be obtained anywhere.

Mr. EVANS, with regard to the sinking of a shaft in the place indicated by Mr. Batters, explained that that would be inadvisable from the nature of the ground, and explained that a level was being driven with the view to intersect various lodes. He believed the north discovery lode existed in Mona the same as in Parys Mine, and drifting had been begun at the 70 for the purpose of discovering that.

Mr. BATTERS asked what were the prospects for the future?—Mr. EVANS replied there was one item in the accounts to which he would direct their attention, and that was the sale of copper regalins, 10,800*t*.—In the previous year it was about 700*t*. He thought that that was rather a promising feature, and he was almost certain that the returns of ore would continue to increase much more rapidly in the future, and the expenses would not increase. He hoped to pay a dividend, and was disappointed that they had not done so on the present occasion. He and his father had known the mine for the last 70 years, and it had never failed to pay a dividend until latterly. The returns of ore were diminished purposely some time ago, because, as Mr. Kitto pointed out, at his instigation they were carrying away ore too fast consistently with the proper working of the mine.

After some further discussion, the report was adopted, and the retiring directors and auditors having been re-elected, a vote of thanks to the Chairman and directors terminated the proceedings.

NEW TRUMPET CONSOLS.

The statutory meeting of shareholders was held on Saturday at Mr. E. J. Bartlett's offices, Great St. Helen's—Mr. HENRY ROGERS in the chair. The notice calling the meeting having been read,

The CHAIRMAN said—This, gentlemen, is the first meeting we have held since the company has been registered as limited company, and I am happy to tell you that our operations have progressed as satisfactorily as possible, and I think that our prospects are more than reasonably good. Since we have commenced operations the mine has been inspected by several competent people in the county, all of whom are well conversant with the district and with this set. Recently the mine has been inspected by Capt. Curtis, who is mineral agent to His Grace the Duke of Leeds, for the Penrose estate, Mrs. Trevelyan, and others, and manager of several mines in the county. His report is that the mines have been most valuable and productive, having yielded upwards of 300,000*t*. worth of tin, from which large dividends have been declared. I am happy to tell you that having been owner of the mine for twenty years, I had the great pleasure of dividing a considerable portion of those dividends; but, of course, we have had black tin at 9*s*. a ton. I sold in one day about 9000*t*. worth of tin from East Lovell to two Cornish smelters, I believe, at 9*s*. a ton, but it gradually declined to 3*s*. which was the reason the old operations were suspended. Capt. Curtis reports three lodes which are being developed—Wheat Franchis, Wheat Valls, and Wheat Nook. "There is," he says, "ample machinery to work to a considerable depth, and excellent water and steam power for the economical return of a large quantity of tin. I consider the property most valuable, and can strongly recommend it to the investing public, and I quite approve of the present mode of operations." That is, in brief, Capt. Curtis's report, and I should tell you that he has a mine, which he is now working, called Cumbwallack, not very far from Trumpet Consols—not on the same lode, but in the immediate district—and he knows the set very well. In addition to Capt. Curtis, it was suggested to me that he who I may term the "king of miners," Capt. Josiah Thomas, the manager of Dolocath, should report also upon this mine, and he did so the week before last. I asked him if he would allow me to have a copy of his report which he made for Dr. Kennedy, who is present to-day, and who is a very large shareholder. That request was granted, and I may tell you at once that his report is a favourable one. (Hear, hear.) After going through the various lodes, he sums up in this way:—"It seems strange that the western ground and all the lodes above mentioned should have remained so long untried, seeing that the same lodes further east produced such large quantities of tin, but I understand that there was formerly some difficulty in obtaining the grant of the western ground." (This present company has secured.) "The speculation I consider to be good, and the various lodes can be tried at comparatively small cost. There is a large quantity of water in the river, which can be used in pumping power for the mine, as well as stamping the stuff, which will effect a great saving in the cost of working, as compared with steam power." Here (continued the Chairman) is a section of one of the lodes called the Wheat Valls, and upon that Capt. Thomas speaks very strongly. He says—"This lode produced a large quantity of tin eastward, where it was worked to a depth of upwards of 180 fathoms. Just before the workings in the old mine were suspended a good lode was met with to the west of the cross-course in the 14*s*, above which the lode is standing unworked to surface." I may tell you that the principal shareholders in the old company died, and as soon as I could obtain the grant of that ground, Capt. Quantrell has appended a memorandum, in which he says that during the last four weeks' working some of the men were so successful that they raised 1600*t*. worth of tin. We have now taken up a shaft which they commenced sinking from the surface, which is down about 40 fms., and again come into the tin ground, which is improving as we go on. We have a 40-inch cylinder engine, which is paid for, and we shall soon be selling a parcel of tin. There are good prospects in exploring the western ground, according to Capt. Curtis. A good deal west of this mine there was an extensive copper mine, from which considerable quantities of that metal were obtained.

Dr. KENNEDY: What are the costs now?—The CHAIRMAN: Our labour cost is about 12*s*. a month. A good deal of it is easy ground, the lodes being small but rich, and hence more profitable to be worked. The mines paid regular and increasing dividends for seven years at every quarterly meeting.

Mr. E. J. BARTLETT (director): On looking through Capt. Josiah Thomas's report I consider it very favourable. (Hear, hear.)

The CHAIRMAN: I would suggest to the shareholders, in their own interests, that the mine should receive a vigorous development, and that we should raise 2000*t*. additional capital, and before the expenditure of that money I hope to be able to report to you very good results.

Mr. BARTLETT: In accordance with that suggestion, I beg to propose that of the shares in reserve 2000*t*. worth be issued at par, subject to a first call of 5*s*. a share, and the balance as may be required, giving 5 per cent. to those who pay up in full on allotment.

The CHAIRMAN: With the money already subscribed we have purchased two engines and a variety of machinery.

Mr. BARTLETT: Although we are working by water-wheel, we thought it advisable to purchase all the good machinery left by the former proprietors, so that in giving the mine an extensive development, we shall be able simply to connect the flat-rods with one of the principal engines and go on working.

The CHAIRMAN: We have several water-wheels and other appliances ready for working, and I take it, that our machinery is well worth 100*s*. and, if you provide the 2000*t*. we shall be able to bring about satisfactory results. I have no objection myself to increase my interest, notwithstanding the large number of shares I already hold.

Mr. W. H. BUMPUS proposed that Mr. Henry Rogers, Mr. E. J. Bartlett, and Mr. Kennedy be re-elected directors.—The motion was seconded by a SHAREHOLDER, and carried unanimously.

The meeting afterwards closed with a vote of thanks to the Chairman.

GREAT WESTERN ELECTRIC LIGHT AND POWER COMPANY.—At a special meeting of shareholders, held on Tuesday, at the City Terminus Hotel, resolutions were submitted for expunging Article 40 and the words "or the person entitled to the share by transmission as the case may be" in Article 41 of the Articles of Association. Mr. H. Russell Evans, who presided at the meeting, stated that the alterations were necessary in order to comply with the requirements of the Stock Exchange before they could obtain a settlement and quotation for their shares. Replying to a question, the Chairman stated that they had sold Devon and Cornwall, and had important negotiations pending for the sale of some other portions of their district. The resolutions were passed.

ANGLO-AMERICAN BRUSH ELECTRIC LIGHT.—At a meeting of the directors of the corporation, held on Thursday, it was unanimously resolved that—"The British Electric Light Company (Limited) having issued notices to several of the licensees for the sale and users of dynamo machines manufactured by the corporation, which notices claim that such dynamo machines are infringements of the 'Gramme' patent of June, 1870, belonging to the British Electric Light Company, and the directors of this corporation being advised that such a claim on behalf of the British Electric Company is utterly untenable, the corporation is prepared to guarantee the licenses for the sale and users of dynamo machines

manufactured by them against the claim of the British Electric Light Company."

BRUSH MIDLAND ELECTRIC LIGHT AND POWER COMPANY.—At an extraordinary general meeting of shareholders held on Thursday, at the City Terminus Hotel, Mr. James Whitehead presiding, three resolutions were passed striking out clause 40 of the Articles of Association; the words "or the person entitled to the share by transmission, as the case may be," out of Article 41; and the words "or otherwise interested" out of Article 112. The Chairman stated that the directors fully concurred in the alterations which had been suggested in the company's Articles of Association by the Committee of the Stock Exchange.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. J. H. REYNOLDS, stock and share broker, Redruth (June 1), writes:—A steady business is doing in Dolcoath, East Pools, Cook's Kitchens, Wheal Bassett, Killifreths, South Frances, &c., at quoted prices. Subjoined are the closing quotations:—Blue Hills, 1*s*. to 1*s*. 6*d*; Carn Brea, 1*s*. 1*s*. to 1*s*. 1*s*. 6*d*; Camborne Vein, 5*s*. to 7*s*. 6*d*; Cook's Kitchen, 3*s*. to 3*s*. 6*d*; Dolcoath, 7*s*. to 7*s*. 6*d*; East Pool, 5*s*. to 5*s*. 6*d*; East Blue Hills, 10*s*. to 12*s*. 6*d*; Mellanear, 4*s*. to 4*s*. 6*d*; North Herodsfoot, 7*s*. to 10*s*.; New Kitty, 2*s*. to 2*s*. 6*d*; Pedn-an-drea, 3*s*. to 3*s*. 6*d*; Phoenix, 2*s*. to 2*s*. 6*d*; South Condurrow, 8*s*. to 8*s*. 6*d*; South Crofty, 10*s*. to 10*s*. 6*d*; South Frances, 1*s*. to 1*s*. 6*d*; South Penzance, 7*s*. to 7*s*. 6*d*; West Bassett, 11*s*. to 11*s*. 6*d*; West Polde, 1*s*. to 1*s*. 6*d*; West Poldice, 5*s*. to 5*s*. 6*d*; West Seton, 18*s*. to 19*s*.; West Tolgus, 13*s*. to 14*s*.; Wheal Agar, 8*s*. to 8*s*. 6*d*; Wheal Basset, 1*s*. to 1*s*. 6*d*; Wheal Grenville, 10*s*. to 10*s*. 6*d*; Wheal Hony and Trelawney, 2*s*. to 2*s*. 6*d*; Wheal Kitty, 1*s*. to 1*s*. 6*d*; Wheal Jane, 3*s*. to 3*s*. 6*d*; Wheal Pevor, 9*s*. to 10*s*.; Wheal Uny, 3*s*. to 3*s*. 6*d*; Wheal

Royalton, 38s.; St. Just United, 65s.; South Frances, 12½%; South Crebor, 7s. 6d. to 10s.; South Devons, 15s. to 17s. 6d.; Tamar, 7s. 6d. to 10s.; Treaveans, 6s. to 8s.; Tin Hills, 10s. to 15s.; United Van (pref.), 15s. to 20s.; Walkham United, 10s. to 15s.; West Holway, 20s.; West Kilty, 3 to 6½%; West Cliverton, 15s. ds.; Wheal Coates, 12s. 6d. to 15s.; Wheal Janes, 15s. to 25s.; Wheal Grenville, 10 to 10½%; Wheal Bassett, 10½%; and Wheal Owcombe, 6 to 8s.

In shares of gold and silver mines, there has been more business doing. Richmonds are steady at 7½ to 8½%, but there has been more business doing in Indian mines, which have all advanced. Akankos are at 5s. to 10s.; Australian mines, 5s.; Central Wynand, 7s. 6d. to 12s. 6d.; Colombian Hydraulic, 4s. to 6s.; Carta Para, 10s.; Eureka, Nevada, 4s. to 6s.; Effuents, par to 10s. prem.; Gold of Canada, 10s. to 15s.; Indian Consolidated, 17s. 6d. to 20s.; Indian Kingstons, 7s. 6d. to 12s. 6d.; I.X.L., 15. 3d. to 2s. 6d.; Isabelle, 6s. to 8s.; New Gold Run, 2s. 6d.; ditto (pref.), 4s.; New Callao, 5s. to 10s.; Port Phillip, 4s. to 6s.; Rio Grande do Sul (B), 20s. to 30s.; Sierra Buttes, 30s. to 32s. 6d.; Simon Reefs, 2s.; Silver Peak, 3s. 9d. to 5s.; Tambacherry, 18s. 9d. to 25s. 6d.; United Mexican, 17s. 6d. to 22s. 6d.; and Wala Wynand, 7s. 6d.

In shares of oil and miscellaneous companies there is no particular change in prices to notice. Glasgow Coal Exchange shares are at 18s., and Lawes Chemicals, 5½ to 6s.

EDINBURGH.—Messrs. THOMAS MILLER and SONS, stock and share brokers, Princes-street (May 31), write:—The markets have continued inactive. North British Railway stock has risen from 95 to 95½; Great Western from 144 to 145½; North-Eastern from 170 to 171½; Brighton Deferred has receded from 142½ to 141½. Several Preference, Guaranteed, and Debenture stocks have risen to higher prices. Among them may be mentioned North British 5 per cent. Convertible, 137½; Preference, which has improved from 117 to 122. Canadians have latterly been very firm. Grand Trunk Second Preference has improved from 82½ to 83½; and the Third from 36½ to 37½; Great Western from 13½ to 13½. There has been very little done in America ns, and prices of these are generally lower. In Banks British Linen has risen from 290½ to 291½; Clydesdale from 24½ to 24¾; Royal from 212 to 213. There has been a recovery in a number of insurance shares, which were lately depressed. North British and Mercantile have advanced from 59 to 60; Royal from 30½ to 31; Liverpool, London, and Globe from 21½ to 21½. Edinburgh Life have declined from 43 to 42½; Standard Life from 57½ to 57. Prices of Colonial and American land companies have been well supported. In mines Arnoton Coal have risen from 11 to 11½; Fife Coal from 7½ to 8½; Clyde Coal from 38s. 6d. to 41s. 9d.

IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

CORK.—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mall (May 31), write:—Markets were steadier to-day. Great Southerns were bought at 113, Midlands steady at 83, Wicklows advanced to 82, and Great Northerns were done at 118. National Banks shares changed hands at 23 9-16ths, and Hibernians rose to 33½, 34. Munsters remain 7 1-16th. Cork Packets unaltered. Cork Gas shares changed hands at 6½, Gouldings were 8½, Daleys enquired for at 2, and Harbour Board Debentures at 102½.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

THE MANCHESTER AND DISTRICT EDISON ELECTRIC LIGHT COMPANY (Limited).—Capital 600,000*l.*, in shares of 10*l.* The business of electricians in conjunction with certain patents. The subscribers (who take 200 shares each) are—J. H. Agnew, Manchester; J. Mather, Salford; J. K. Armitage, Rochdale; E. Cross, Bolton; J. C. Lee, Manchester; C. Moseley, Manchester; J. C. Waterhouse, Manchester.

THE WEARDALE MINERALS COMPANY (Limited).—Capital 100,000*l.*, in shares of 5*l.* To acquire the leasehold properties known as Sunnyside and Holbeck, situate in the parish of Walsingham, county Durham, under the provisions of a contract made between Vernon Miller, H. C. Bunkell and the company, for the purpose of carrying on all operations connected with mining, raising, getting, working and quarrying, smelting, extracting and refining, selling and disposing of, forging, casting, rolling and shipping ores, minerals and metals, and the general business of merchants of metals and minerals. The subscribers are—S. Trinkett, Millwall, stone merchant, 20; W. Baum, 14, Watling-street, merchant, 20; T. R. Taylor, Middlesbrough, insurance agent, 20; S. R. Smyth, Palace Chambers, engineer, 20; R. V. Davies, Seven Sisters-road, brick merchant, 5; J. Hervieu, 14, Watling-street, merchant, 5; A. Martin, Beckenham, merchant, 5. The board consists of the following—Messrs. Trinkett, Baum, and Taylor; the number of director must not exceed seven or be less than three, the qualification being fixed at 20 shares.

THE SOUTHERN MAHARATTA RAILWAY COMPANY (Limited).—Capital 3,000,000*l.*, in shares of 20*l.* Constructing, equipping, maintaining and working railways in the East Indies. The subscribers (who take 50 shares each) are—T. D. Forsyth, 76, Onslow Gardens; F. Youle, 155, Fenchurch-street; E. S. Davies, 13, Austin Friars; F. Francis, 36, Courtfield Gardens; F. S. Chapman, 36, Stanhope Gardens; J. S. Trevor, 75, Ladbroke-road; S. R. Scott, 7, Draper's Gardens.

PRESTON UNION BANK (Limited).—Capital 20,000*l.*, in shares of 10*l.* A banking business of every description. The subscribers (who take one share each) are—J. Butler, Fulwood; T. Heaps, Preston; C. Rowe, Preston; W. Livesey, Preston; J. Clegg, Preston; R. Brumwell, Fulwood; W. B. Ridgall, Fulwood.

THE CO-OPERATIVE LAW ASSOCIATION (Limited).—Capital 25,000*l.*, in shares of 1*l.* The business of accountants, auditors, sharebrokers, liquidators, &c., in the interests of its subscribers. The subscribers (who take one share each) are—J. H. Hope, Poplar; W. Bridge, Stamford-hill; S. H. Cleaver, 17, Holborn; G. Keen, Islington; J. Fernie, Anerley; A. de Radecki, 13, Bristol Gardens; H. Plummer, 15, Commercial-road, E.

THE SCOTTISH PILSEN-JOEL AND GENERAL ELECTRIC LIGHT COMPANY (Limited).—Capital 200,000*l.*, in shares of 5*l.* The business of an electrician in conjunction with several patents. The subscribers (who take 50 shares each) are—H. E. Knight, 101, Cheapside; V. B. Tritton, 63, St. George's-square; J. D. Dawson, 12, Ryder-street; W. Crummelin, Putney; D. Parish, 2, Cophall Buildings; F. P. Fellows, Reform Club; D. M'Innes, 50, Bernard-street, I.

THE SINGLE WIRE MULTIPLE TELEPHONE SIGNAL COMPANY (Limited).—Capital 5000*l.*, in shares of 10*l.* To acquire certain patents and carry on the business of a telephone company in all branches. The subscribers (who take one share each) are—W. H. Davies, 17, Cornhill; W. Flux, 17, Warrington-crescent; H. A. C. Saunders, 107, Grosvenor-road; G. R. Neilson, 66, Old Broad-street; A. C. Brown, Rotherhithe; K. J. M. Anderson, 10, Throgmorton Avenue; W. H. Barwood, 10, Throgmorton Avenue.

THE GWERNIA COLLIERY COMPANY (Limited).—Capital 5000*l.*, in shares of 10*l.* To adopt and carry into effect an agreement for the purchase by the company of a certain colliery and premises, part of the Gwernia Fawr Farm, situate in the parish of Myndydylwyn, Monmouthshire, with the plant, machinery, fixtures, stock, chattels, effects, goodwill, &c., and generally to carry on the business of colliery proprietors, coal and coke merchants, and shippers in all branches. The subscribers are—T. Freeman, jun., Hengoed, colliery proprietor, 12; T. Freeman, Fleur-de-lis, no occupation, 12; D. S. Davies, Hengoed, commercial traveller, 12; A. Mitchell, Hengoed, surveyor, 12; W. Haines, Maes-y-Cwmmer, collier, 12; G. D. Morgan, Nelson, clerk, 1; W. E. Freeman, Hengoed, clerk, 1; Messrs. T. Freeman, sen. and jun., Davies, and Mitchell are to be the first directors. Qualification, 10 shares.

THE HOME, FOREIGN, AND COLONIAL ELECTRIC AND POWER SHARE TRUST COMPANY (Limited).—Capital 1,500,000*l.*, in shares of 10*l.* To acquire, hold, and otherwise deal with shares and stock of electric light and power companies. The subscribers (who take one share each) are—T. J. Hanley, 27, Nicholas-lane; C. Bouts, Brixton; A. E. Wood, 16, St. John's Wood; W. Scott, 108, Bishopsgate-street; A. W. Gay, 88, Bishopsgate-street; C. Reade, 29, Kellett-road; T. W. Lee, 2, Pancras-lane.

THE BATTERSEA AND NEW WANDSWORTH PUBLIC HALLS COMPANY (Limited).—Capital 20,000*l.*, in shares of 1*l.* To acquire land, erect and maintain public hall, library, baths, &c. The subscribers (who take five shares each) are—B. T. L. Thomson, Lavender Hill; H. J. Hansom, Battersea; R. W. Earl, Battersea; R. R. W. Oram, 13, Clapham Common Gardens; T. Spearing, Bennerley-road; A. Morris, 169, Bromwood-road; J. Beddoe, 28, Almerio-road.

THE RIVER PLATE FRESH MEAT COMPANY (Limited).—Capital

200,000*l.*, in shares of 10*l.* The business of preservers and importers of fresh meat and other produce. The subscribers (who take one share each) are—G. Drabble, 1, Femburidge-square; J. Pullen, Lower Eaton; J. Anning, 11, Lime-street; G. R. Davies, Manchester; A. Henderson, 28, Austin Friars; C. Gunther, 9, Fenchurch Avenue; C. T. Drabble, Manchester.

WILLIAM HARRIMAN AND COMPANY (Limited).—Capital 10,000*l.*, in shares of 1*l.* To acquire the goodwill and carry on a business of manufacturing fire-bricks, sanitary tubes, terra-cotta, and fire-clay, &c., at Blaydon, Durham. The subscribers (who take one share each) are—J. A. Game, Newcastle-on-Tyne; A. Watson, Ryton; T. D. Stewart, North Shields; W. Keith, jun., Aberdeen; J. Jenkins, Blaydon; S. W. Stewart, North Shields; B. H. Frampton, 66, Granger-street.

THE SOUTHAMPTON DRUG COMPANY (Limited).—Capital 10,000*l.*, in shares of 1*l.* To purchase and carry on a business of chemists, druggists, and perfumers. The subscribers (who take one share each) are—W. Till, Morton; S. Alpass, Thornbury; W. Smith, Berkley; J. Lord, Cirencester; W. Pritchard, Hereford; E. T. Pritchard, Edinburg; W. Day, Southampton.

THE OSBORNE CATTLE FOOD COMPANY (Limited).—Capital 10,000*l.*, in shares of 5*l.* Manufacturing, selling, and dealing in cattle food, and every description of feeding stuff. The subscribers (who take one share each) are—W. H. Helmer, 171, Brockley-road; C. Harrison, Stratford; C. E. Kay, 9, Fenchurch-street; F. Buck, 126, Graysford-road; A. Lloyd, Lordship-lane; J. O'Connor, Balmfield, 23, Burntash Hill; T. P. Smithers, Ealing; J. Gray, 2, Saville-row; J. D. Fraser, Devon; J. Mackenzie, Whitstone.

L'ASSOCIATION (Limited).—Capital 12,000,000*l.*, in shares of 20*l.* To establish, acquire, undertake, and conduct every kind of business, profession, enterprise, or occupation, in every part of the world. The subscribers (who take one share each) are—E. A. Waller, 22, Dodington-grove; H. Beckwith, jun., 96, Palmerston Buildings; W. Lichfield, 23, Burntash Hill; T. P. Smithers, Ealing; J. Gray, 2, Saville-row; J. D. Fraser, Devon; J. Mackenzie, Whitstone.

THE SOUTHWELL BREWERY COMPANY (Limited).—Capital 30,000*l.*, in shares of 10*l.* To purchase and continue a brewers' business established in different places in Leicestershire. The subscribers (who take one share each) are—H. P. Long, Southwell; J. N. Sedgley, Leicester; G. Langtry, Southwell; W. Robinson, Southwell; J. E. Page, Bedford; W. C. Bird, Leicester; S. Rheinberg, 13, Well-street.

NORTH BRAZILIAN SUGAR FACTORIES (Limited).—Capital 450,000*l.*, in shares of 20*l.* To acquire a concession for establishing and working various sugar factories in the province of Rio Grande do Norte. The subscribers (who take one share each) are—C. H. Whitehurst, 23, White Lion-street; J. Killworth, 59, Russell-road; W. A. Dawson, Putney; A. Fyson, Richmond; J. L. Wanklyn, 100, Piccadilly; E. A. Henley, 1, Chilworth-street; J. Strict, Swansea.

THE FISH EXCHANGE (BLACKFRIARS) (Limited).—Capital 60,000*l.*, in shares of 10*l.* To establish and maintain a fish market at the junction of Queen Victoria-street with Upper Thames-street, London, E.C. The subscribers (who take one share each) are—Earl of Onslow; E. L. Pemberton, 5, Warwick-square; A. B. Brooks, 3, Cromwell-place; W. W. B. Beach, 17, Suffolk-street; A. J. Otway, 13, Eaton-place; S. S. Hogg, 37, Cromwell Gardens; H. Skinner, North Finchley.

PREVENTING BOILER INCRUSTATION.

For some years past an improved chemical boiler compound, which has the advantage that it not only prevents incrustation, but at the same time protects the plates, has been manufactured and supplied by Mr. W. H. MORGAN, of the Engineering Chemical Works, Gloucester, the secret of his success being the use of a liquid decrustator, a small quantity of which is injected into the boiler daily. As Mr. Morgan has given much practical attention to the question of preventing boiler incrustation, and as it is a question that can only be satisfactorily solved by the application of some knowledge of chemistry and engineering, he claims that, by his twelve years' experience, he has become thoroughly acquainted with all the difficulties and dangers to be overcome and avoided. As long ago as 1873 he took a patent for a composition and an injector for putting it daily into the boilers, which was fairly satisfactory, but was expensive, and not applicable to all kinds of water. He now produces an article at one-third the price, which preserves the boiler plates from the action of acids, and which at the same time is adapted to any water whatever. During the past 1½ year it has been used with some of the worst water and in the largest works in the Midlands.

An objection to which Mr. Morgan directs attention, and which applies equally to the many different kinds of solid matters, as also to the liquid preparations, is the fact that they are applied only when the boiler is not working, when it is put in in large portions to act upon the boiler for three or four weeks at least; a moment's consideration will show that this is simply absurd. Suppose, says Mr. Morgan, we put into a clean boiler, say 20-horse power, a portion of any preparation said to last for one month, the water in the boiler will be exhausted in a few hours, and as a consequence the greatest portion of the preparation with it; it may perhaps affect the water coming into the boiler to some extent for a little while, but as the supply of water is constantly going in, whatever was put in at first must and soon will be exhausted and driven off with the steam, so that in one-fourth the time allotted it is gone, and the boiler is minus anything that can counteract the scale-forming salts. He is certain, he continues, that no mere mechanical means can ever prevent this great and expensive nuisance of incrustation; it must be done by the continual presence of some decomposing chemical, for the reason that in all waters we get a quantity (some waters are more highly charged than others) of mineral matter, such as carbonate and sulphate of lime, carbonate of magnesia, and many other salts, most of which remain soluble so long as the water contains carbonic acid (hence the reason that we get little or no incrustation from cold water, except in rare cases, where the water rids itself of this through certain causes). This carbonic acid is driven from all waters in the act of boiling, the consequence is the above-named salts, having no solvent, are precipitated in a fine crystalline form tenaciously adhering to the inner surface of the boiler, it rapidly increases and gets harder until the boiler has often been heated to more than double the temperature it should be. This of course is both dangerous and expensive; it is admitted by

all practical engineers that ½ in. of incrustation will increase the consumption of fuel more than 50 per cent. It was, he says, to overcome this difficulty and remove as well as prevent incrustation without in any way injuring the boiler, water, or steam that he invented his improved injector, which is an apparatus attached to the feed-pipe, by which means a small portion of the compound is injected into the boiler daily while it is working; it is very simple, having but one valve will not easily get out of order, and requires no attention further than filling, which is the work of a moment.

Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. CXCIX.*
BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.
Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal.)

[The Author reserves the right of reproduction.]

TWO-DECK CAGES.—The following is from the Hemitz Colliery, near Saarbrücken:—The framework of the two decks consists of U-iron, two pieces running at right angles to the line joining the centres of the conductors and parallel to the rails on which the corf rests, and four pieces parallel to the lines joining the centres of the conductors. The latter are joined to the former by L-shaped pieces of flat bars, whose depth is equal to the inside depth of the U-iron. The upper sides of the frames are covered by flat sheets, upon and to which are fixed the rails formed of angle iron. The rails are bent outwards at the ends and facilitate the passage of the corf into the cage. The main cross piece forming the top of the cage-frame is made of two parallel plates of U-iron, which are connected at the ends to two short cross-plates. From the outside of each of these two long pieces of U-iron run to the outer corners of the bottom frame of the cage to which they are connected, and likewise to the second deck, where they cross the frame of the deck. This latter is also connected to each of the two short cross plates above-mentioned by two flat bars. A short distance below and parallel to the two short cross plates are two long narrow flat bars, which are riveted to the above-mentioned flat bars and to the long inclined pieces of U-iron. These last-mentioned horizontal flat bars are connected downwards from the ends to the frame of the top floor or deck by vertical pieces of U-iron, and also to each deck by the long vertical pieces of angle iron, which serve at the same times as shoes or guides for the cage. To protect the miners when travelling in the shaft from pieces falling on to them the cage is covered with an arched roof of sheet-iron. This cage is intended to carry two corfs in each deck. Each corf when empty weighs 5½ cwt., and when full, 11 cwt.; the cage itself weighs 2 tons, 12 cwt.

The following is an example of a two-deck cage made chiefly of wood. The frame forming the floors or decks are made of two pieces of wood 4 in. square, 42 in. long, connected by three cross-pieces of wood of the same section and 25 in. long, which are dove-tailed into the former. The top frame has the same construction, with the exception that the middle cross piece is omitted in order to leave room for the safety catch. The three frames are connected by six beams, three on each side, 2½ in. by 3½ in. in section, and 13 ft. long. These are connected to the three frames by iron plates both on the inside and outside of the long beams, bolts passing through both wood and iron. The construction is such that each bolt connects two plates of iron with the wood beams or frame between the plates. Between the long beams on the longer sides and on the outside of the frames to which they are attached are four planks or boards 13 ft. long 2 in. thick and 8½ in. wide. The two lower frames (or the decks) are 4 ft. 6 in. apart, and are covered with 1 in. planking, on which the rails are placed. On the lower frame cast-iron shoes or guides are provided for embracing the conductors, which are 4 in. wide. The cage is supported from a long piece of cast-iron 3½ in. by 2 in. in section, the ends being shaped to form shoes or guides fitting the conductors. The cage is suspended from this cross piece by means of flat bar iron, which is bent over the cross piece otherwise, and has the lower ends attached to the top frame and the top ends of the long vertical planks. These suspension pieces are covered by sheet-iron to protect the miners when riding in the shaft. The above design is intended to carry only one corf on each deck. The cage weighs 12 cwt., the empty corfs 2½ cwt. each, and the full corf 12 cwt.

At the Krug shaft of the King's Colliery in Upper Silesia, the following construction was used for a cage to carry four corfs, two in each deck, the corfs being placed end to end. The frame of the two decks is formed of wood as well as the top frame, the pieces being dovetailed together at the corners. The frames are connected together on each long side by means of three flat iron bars, the centre one being 4½ in. wide by 1½ in. thickness, and the two side ones 3 in. wide by 1½ in. in thickness. The spaces between these are filled in by sheet-iron 1-12th in. in thickness, and attached to the frame above and below by means of angle iron. The shoes or guides to fit the conductor are attached to the short sides of each frame, and are formed of I-iron. The weight of the empty cage is 2 tons 5 cwt. loaded, with four full corfs 5 tons 3 cwt.

The following is an example of a three

tion. The four outside, or corner bars, however, are rolled T section, the rib being, however, only 1 in. deep. The cage is stiffened by bars $2\frac{1}{2}$ in. by 1 in. in section running diagonally between the long vertical bars, and taking the shape of a flat \geq placed vertically. The rails, which are L-shaped, are carried by two cross pieces of bar iron, 5 in. by 1 in. in section, and by the end of the frames. The flat cross bars are supported by a piece of 4 in. by 1 in. iron placed vertically and running along the centre of the frame parallel to the two longer sides, being bent at right angles at the ends, where they are attached to the frames. In order to lessen as much as possible the weight of the cages without sacrificing strength and stiffness, Edwards, of Wednesbury, constructs the cages of iron piping, the connection between the vertical and horizontal pipes being effected by T-pieces. It is necessary that the screw threads at the two ends of the same piece of piping should be of opposite brands. The long vertical corner pieces terminate at the lower ends in conical-shaped castings, or feet, on which the cage rests; a buffer arrangement forms the support for the cage feet at the bottom of the shaft. The ratio between the weight of the cage and the weight of the mineral to be raised varies, according to Von Hauer, from 4-10ths to 16-10ths; for a good construction the ratio should be between 6-10ths and 10-10ths.

ARRANGEMENTS FOR LOCKING THE CORF IN THE CAGE.—The following is sometimes used for cages having triangular side frames. A piece of round iron, bent at the two ends at right angles, is hinged by these ends to the two sides, and hangs in an inclined position downwards, so that the middle horizontal portion is in front of and at about the height of the centre of the body of the corf. It is retained in this position by a short rod hinged at one end, at the same level as the above-mentioned horizontal bar, and having a notch on the underside of the opposite end, which drops over the bar. When it is desired to withdraw the corf the horizontal bar is released, and raised so far back that it rests against the sides of the cage above the corf.

The simplest and most usual arrangement in the case of cages of rectangular shape is to hinge a short catch so formed at the hinge that it cannot drop down below an horizontal position, and which can be raised so far past the vertical as to rest nearly vertical, in which position the corf can be drawn out of the cage, whilst the catch projects so far when horizontal as to come in front of the corf and hold it in the cage. Two catches at each end of the cage are usually hinged to one long rod, which reaches from end to end of the cage, so that both ends of the corf are locked and unlocked simultaneously, and the corves can be either drawn out or pushed out. When the cage is a double-decked cage the catch is often arranged in the centre of the ends of the second deck, and hinged in the centre of the catch, so that when the catch hangs vertically the upper portion projects in front of the bottom of the corf on the second deck, whilst the lower portion of the catch projects in front of the top of the corf resting on the bottom of the cage.

The following arrangement is designed where two corves are carried in each deck end to end. Two bars are bolted down at two adjoining ends of the bars, either by means of one common bolt at or by two bolts near the centre of and to the bottom of the cage, and in such a manner that the bars act as flat springs, the opposite ends tending to rise. These ends are flattened out to form a sort of pedal, on which the foot can be placed to press them down. Near these ends the bars, or flat spring pedals as they may be termed, are provided with a short vertical projecting piece, which when the spring pedals are raised catch against the front corf axles and lock the corves in position. The spring pedal is prevented from rising too high by a bridge which is bolted to the bottom of the corf, and has two steps side by side. The lower step is of such height that when the spring pedal is pushed beneath it the axles are clear of the short vertical catch or projection on the spring pedal. The spring is not held rigidly at the end by the above-mentioned bolt, but has sufficient lateral play that when depressed by the foot it can be pushed a little to one side or other by the foot, so as to come beneath either the low or high step of the bridge. This arrangement leaves the hands of the hanger-on or banksman free, so that he can seize hold of the corf at the same moment that he unlocks the latter. When the corf has been pushed on to the cage a slight lateral pressure moves the spring pedal from beneath the lower step of the bridge, when the pedal springs upward at the loose end, catching against the axle and locking the corf in the cage. This arrangement greatly reduces the time required for loading and unloading the cages.

At the Redan Colliery, near Saarbrücken, an automatic-locking arrangement is used. It consists of two slightly S-shaped pieces of iron or catches, hinged at their centres to a common bolt. One end of each catch is heavier than the other, so that when hanging freely they do so in a vertical position, the upper ends projecting so far as to come in front of the bottom of the corf, and lock the corf in position. When the corf comes to rest in the bottom of the shaft, or on the fallers at the pit bank, the lower curved ends of the catches are caught by the support of the cage and pressed outwards, which causes the two catches to take a less highly-inclined position, whereby the upper ends of the catches are depressed so much that they are clear of the corf axles, and the corf can then be run either on to or off from the cage. When the cage is raised from the supports the catches resume their vertical position, locking the corf in the cage.

Another very simple arrangement for locking the corf in the cage, but which is not quite so convenient as some of the above, is to provide an horizontal bar, which is hinged at one end to one side of the frame of the cage, the opposite end of the bar having a very short piece bent at right angles, which drops into an eye fixed to the opposite side of the frame of the cage.

Another arrangement which is actuated by the foot consists of two bars of iron hinged at one end, and bent at right angles at the opposite ends. These catches are connected by two short links to a lever between them, and which is hinged near one end. The pin on which the lever is hinged is midway between the points of attachment to the short connecting links. As the lever is moved to one side or the other the bent portions of the catches are pushed over or withdrawn from the rails, thus locking or unlocking the corf.

The following example is for locking each end of the corf separately, and is fixed above the centre of the corf end. It consists of a short axle or pin carried in two bearings, and having at the outer end a short handle. A straight catch is keyed on the pin, and when hanging vertically downwards projects in front of the top of the corf end. A small square block is keyed on the pin close to the catch. A short flat spring presses the upper surface of the square block in such a manner, that whilst allowing the catch to be readily moved into an horizontal or vertical position, it presses the catch with sufficient firmness to prevent it shaking out of the position (horizontal or vertical) in which it has been placed by hand.

At the Kinnel Colliery the following locking arrangement is used. It consists of a long flat bar of the full length of the rails placed in the centre between the rails. This flat bar is hinged in centre by a bolt passing through the bottom of the cage, so that the bar can be moved laterally. To this bar, at about 18 in. on each side from the centre about which it is pivoted, two cross pieces about 13 to 14 in. long are attached at right angles, but on opposite sides of the bar. When the bar is parallel to the rails these crosspieces project over the rails and lock the corf, but when the bar is pushed sideways (*i.e.*, inclined to the rails) the crosspieces are withdrawn from the rails, allowing the corf to be pushed on to or withdrawn from the cage. The bar is actuated by the foot.

Just published.

THE NORTH WALES COAL FIELDS
Being a series of Diagrams showing the Depth, Thickness, and Local Names of the Seams in the principal Collieries of the various districts, with Index, Geological Map, and horizontal sections across the Ruabon, Brymbo, Buckley, and Mostyn districts.

By JOHN BATES GREGORY and JESSE PRICE,

of Hope Station, near Mold, Flintshire.

Price: Mounted on Holland, coloured and varnished, and fixed on mahogany rollers, 30s. each; or in book form, 12x9, mounted and coloured, 25s. each.

May be obtained, by order, of all Booksellers or direct from the MINING JOURNAL OFFICE, 26, Fleet-street, London, E.C., upon remittance of Post Office Order for the amount.

SAMUEL OSBORN AND CO.,

MANUFACTURERS OF TOUGHENED

CRUCIBLE STEEL CASTINGS

Of all descriptions of special strength and solidity.

ALSO, MANUFACTURERS OF
BEST CAST STEEL FOR ENGINEERS AND MINERS' PURPOSES; FILES; SAWS; HAMMERS; RAILWAY SPRINGS, &c.
STEEL SHEETS AND FORGINGS.

SOLE MAKERS OF

"R. Mushet's Special Steel," for Lathe and Planing Tools and Drills.
THE STEEL WHICH REQUIRES NO HARDENING.

And R. Mushet's Celebrated Extra Best Welding Titanic Cast Steel for Borers.

ADDRESS:—

CLYDE STEEL AND IRON WORKS, SHEFFIELD.

FRANCIS MORTON AND CO., LIMITED, LIVERPOOL.

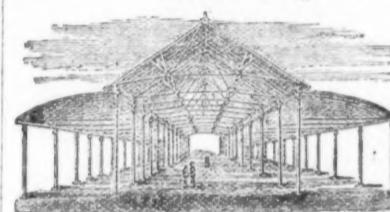
MANUFACTURERS OF

GALVANISED CORRUGATED IRON ROOFS, BUILDINGS, AND SHEDDING,

WHICH THEY HAVE EXTENSIVELY ERECTED FOR THE REQUIREMENTS OF

Forge, Rolling Mills, Puddling Sheds, Ironworks, and Collieries

Erected Complete in this Country, or prepared to Plan for Erection Abroad.

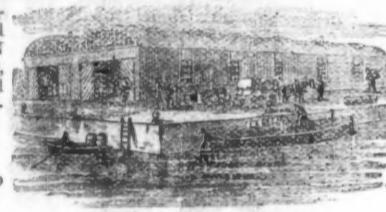


OPEN SHED FOR COVERING LARGE AREAS.

GALVANISED OR PAINTED CORRUGATED IRON ROOFING PLATES and TILES. HEAVY CORRUGATED IRON PLATES for fireproof floors, roadways, parapets, &c. (for producing which F. M. and Co. have recently laid down powerful Hydraulic Machinery). Wrought-Iron Ta Guttering, and General Construc Wrought Ironwork.

DESIGNS PREPARED, AND ILLUSTRATED DESCRIPTIVE CATALOGUES FORWARDED

ON APPLICATION



GENERAL STORE FOR WHARF, ETC.

London Office: 1, Delahay Street (first door out of Great George Street), Westminster, S.W.

FURNITURE EXHIBITION—AGRICULTURAL HALL. STAND 174.

RUSTLESS IRON.

PATENTS OF PROFESSOR BARFF AND MESSRS. G. AND A. S. BOWER.

The PROCESS of COATING IRON and STEEL by these combined Patents is extremely simple and economical, requiring only a specially constructed Muffle or Furnace, which is also applicable to other purposes.

Small articles, not exceeding 9 ft. x 3 ft. x 2 ft., may now be treated at the Furnaces, at ST. NEOTS, HUNTS, on reasonable terms pending the erection of larger Furnaces by Licensees in various manufacturing centres.

LICENSES will be granted to the Iron Trade, Hardware Manufacturers, and others on Royalties based on an average of 5 per cent

value of articles to be treated, ranging from 5s. per Ton upwards.

For Terms, Cost of Apparatus, and all other details, apply to the—

BOWER-BARFF RUSTLESS IRON COMPANY, LIMITED.

23, QUEEN VICTORIA STREET, LONDON, E.C.

POTENTITE.

This unrivalled Explosive, as manufactured by the New and Perfected Machinery of the Company, is perfectly safe or transitory, storage, and use, and is employed in every description of Mining or Quarrying Work, for Tunneling, Pit Sinking, Engineering Work, and Submarine Operations, with the most complete success and satisfaction.

Potentite does not contain its own MEANS OF IGNITION, is free from Nitro-Glycerine, and its SAFETY has been specially demonstrated by public experiments.

Its strength is unequalled.

In action it gives off neither flame, smoke, nor offensive smell. By its use labour is economised, as work can be resumed immediately after the shot is fired.

POTENTITE is specially adapted for export to hot climates, as it is unaffected by heat, and is free from dangerous exudations.

POTENTITE IS THE SAFEST, STRONGEST, AND WORK FOR WORK, CHEAPEST EXPLOSIVE IN THE MARKET

For particulars and prices, apply to the—

LIVERPOOL "POTENTITE" COTTON POWDER COMPANY (Limited)

HEAD OFFICE—3, FENCHURCH AVENUE, LONDON, E.C.



PATENT WIRE TRAMWAYS

Of all descriptions on the Single and Double-Rope Systems; Self-Acting, and Driven by Steam Water, or Horse Power.

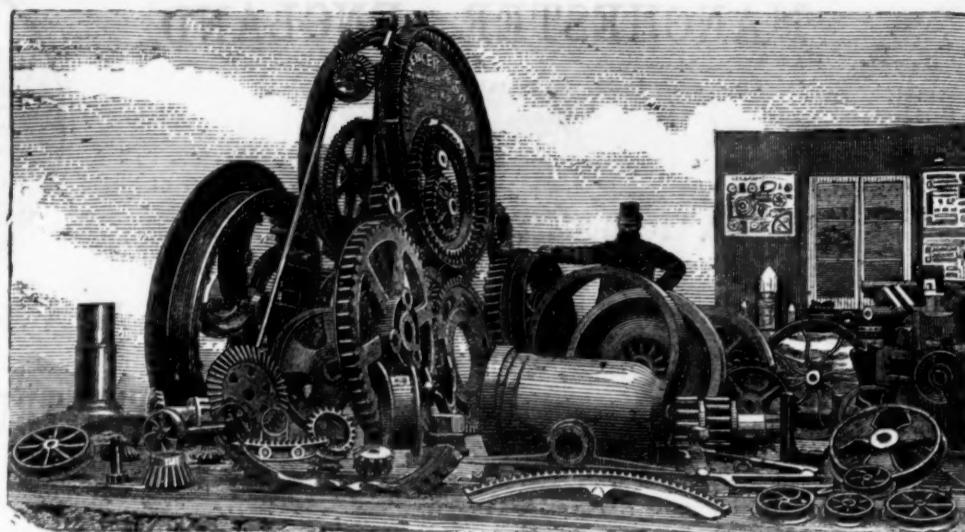
Carrying from 50 to 1,000 tons per day Over 150 miles erected in all parts of the world. For Particulars and Estimates apply

W. T. H. CARRINGTON, 76, Cheapside, London,
ENGINEER AND MANAGER TO THE OWNERS OF THE PATENTS FOR WIRE ROPE TRANSPORT

JOHN SPENCER AND SONS,

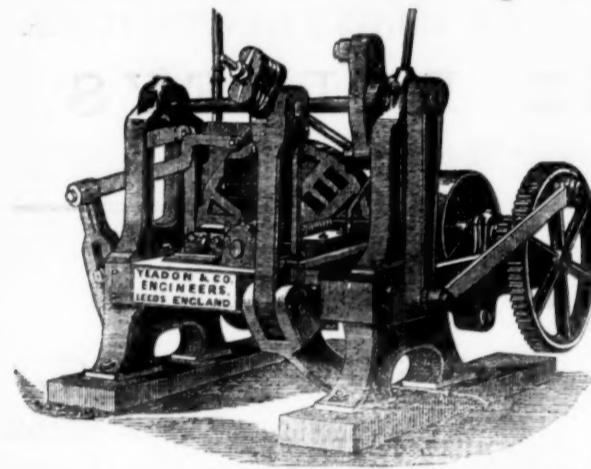
Newburn Steel Works, Newcastle-on-Tyne.

STEEL CASTINGS.
WHEELS & AXLES
FITTED COMPLETE.
INCLINE PULLEYS AND
ROLLERS.
STAMP HEADS AND
SHOES
AND EVERY DESCRIPTION OF
STEEL CASTINGS.



STEEL FORGINGS.
RAILWAY SPRINGS AND BUFFERS,
JUMPER STEEL,
MINING CAST STEEL
AND
BEST CAST STEEL FOR
TOOLS.
IMPROVED VOLUTE SPRINGS

PATENT BRIQUETTE MACHINE.



GREAT SAVING NO WASTE COAL.

NO COLLIERY SHOULD BE WITHOUT.

These Machines utilise small coal or coke by making it into Briquettes or blocks of compressed fuel at the rate of 36,000 per day. The cost of preparing, mixing, and making is under One Shilling per ton. The Briquettes sell readily for Locomotives, Household, or other purposes. Full particulars on application to

**YEADON AND CO.,
LEEDS,
ENGINEERS AND CONTRACTORS,**

FOR EVERY DESCRIPTION OF PLANT FOR

Collieries, Mines and Brickworks.

TESTIMONIALS

Messrs. Yeadon and Co., Leeds. HARBONNAGE DE BERNISSART, PRES PERUWELZ (BELGIUM), JANUARY 4TH, 1878. I continue to be perfectly satisfied with the work performed by the two patent Briquette Machines as well as with that of the Steam Engine, Mixer, &c., which you supplied a few months ago for the manufacture of compressed slack Briquettes, and that I can recommend them as being the best machines I know of, after having carefully studied all the Briquette Machines constructed at home and abroad.

G. FAGES, General Manager.

SOCIETE DES CHARBONNAGES REUNIS DU RIEU DU COEUR ET DE LA BOULE. QUAREGNON (BELGIUM), SEPTEMBER 13TH, 1879.

Messrs. Yeadon and Co., Leeds. We are entirely satisfied with the erection and working of the two Briquette Machines, as well as the Steam Engine and Mixing Apparatus.

A. FRANEAU, Managing Director.

Messrs. Yeadon and Co., Leeds. CHARBONNAGE DE BERNISSART, PRES PERUWELZ, JANUARY 24TH, 1879.

I continue to be highly satisfied with the Briquette Machines which you supplied in 1877. They do their work very well, and produce the Briquettes very regularly, and of a good quality.

G. FAGES, General Manager.

Messrs. Yeadon and Co. SOCIETE HOUILLERE DE VENDIN-LEX-BETHUNE, PAS-DE-CALAIS, DECEMBER 2ND, 1880.

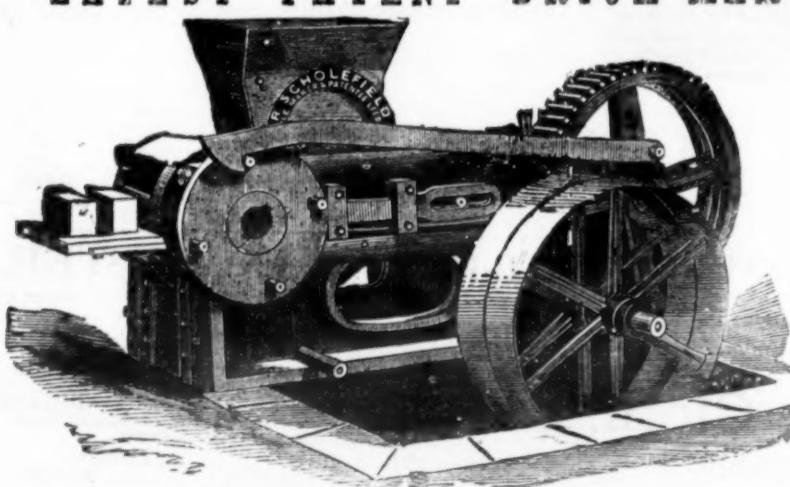
I have the honour to inform you that the Briquette Machines work very well. The Briquettes are very well made. I am highly satisfied with your workmen, who have done their work very well.

SYLVIA CATTIER, General Manager.

The undersigned, Civil Engineer of Mines, Chevalier of the Legion of Honor, Consulting Engineer to the Mines de Vendin-lez-Bethune, Pas-de-Calais, certifies that the Briquette Machinery for making Briquettes of Coal, supplied by Messrs. Yeadon and Co. to the above Company is working to their entire satisfaction.

E. LISBET.

R. SCHOLEFIELD'S LATEST PATENT BRICK-MAKING MACHINE.



production, and the hands required to make 10,000 pressed bricks per day:-

3 men digging, each 4s. per day	.....	£0	8	0
1 man grinding, 4s. 6d. per day	.....	0	4	6
1 boy taking off bricks from machine, and placing them in barrow ready for the kiln, 2s. per day	.....	0	2	0
1 boy greasing, 1s. 6d. per day	.....	0	1	6
1 engine-man, 5s. per day	.....	0	5	0
1 man wheeling bricks from machine to kiln, 4s. per day	.....	0	4	0

Total cost of making 10,000 pressed bricks £1 5 0, or 2s. 6d. per 1000.

(SETTING AND BURNING SAME PRICE AS HAND-MADE BRICKS.)

N.B.—Where the material can be used as it comes from the pit, the cost will be reduced in digging.
As the above Machinery is particularly adapted for the using up of shale, bind, &c., it will be to the advantage of all Colliery Owners to adopt the use of the said Brick-making Machinery.

THE MACHINES CAN BE SEEN IN OPERATION AT THE WORKS OF THE SOLE MAKER AND PATENTEE DAILY.

SCHOLEFIELD'S ENGINEERING & PATENT BRICK MACHINE WORKS
KIRKSTAL ROAD, LEEDS.

£0	8	0
0	4	6
0	2	0
0	1	6
0	5	0
0	4	0

DYNAMOGEN.—A new explosive has been invented by M. PETRI, a Viennese engineer. The name given to it is Dynamogen, and according to the Neus Militarische Blatter, it is likely to compete seriously with gunpowder. The inventor states that it contains neither sulphuric acid, nitric acid, nor nitro-glycerine, and that it cannot injure in any way either gun or cartridge. The charge of dynamogen is in the form of a solid cylinder, which can be increased in quantity without being increased in size by compression. The rebound of the guns with which the new explosive has been tried is said to have been very slight. It is also said that the manufacture of dynamogen is simple and without danger, that it preserves its qualities in the coldest or hottest weather, and that it can be made at 40 per cent. less cost than gunpowder.

HOLLOWAY'S PILLS.—Any dyspeptic sufferer aware of the purifying, regulating, and gently aperient powers of these pills should permit no one to cloud his judgment or to warp his course. With a box of Holloway's pills and attention to its accompanying directions, he may feel thoroughly satisfied that he can safely and effectually release himself from his miseries without impairing his appetite or weakening his digestion. This most excellent medicine acts as a nervine and bodily tonic by aiding nutrition, and banishes a thousand annoying forms of nervous complaints. An occasional resort to Holloway's remedy will prove highly salutary to all persons, whether well or ill, whose digestion is slow or imperfect, a condition usually evidenced by weariness, languor, listlessness, and despondency.

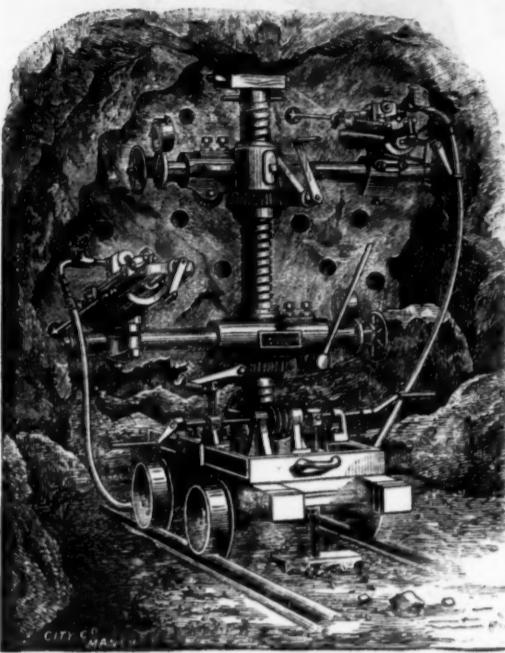
T. LARMUTH & CO.,

ENGINEERS,

MANCHESTER, ENGLAND.



SOLE MAKERS OF
McCULLOCH'S
PATENT ROCK DRILL CARRIAGE
STEAM CRANES, OVERHEAD TRAVELLERS,
ENDLESS CHAIN ELEVATORS, AND FEED SHEETS,
TRAVERSERS AND TURNTABLES,
Engineers' Tools of every description.
LLOYD'S FANS,
MINE VENTILATING FANS,
CENTRIFUGAL PUMPS.



MAKERS OF
STURGEON'S NEW
PATENT TRUNK AIR COMPRESSOR
WINDING AND PUMPING ENGINES,
IMPROVED CONDENSING AND NON-CONDENSING HIGH-PRESSURE
STEAM ENGINES,
With Ordinary or Expansion Valves, Compounded on Non-
Compounded
SPECIALITIES FOR
LEATHER BELTING MANUFACTURER

SHAFTING, GEARING, AND PULLEYS.

Sole Makers of J. Priestman and Son's Patent Leather Striking Machines.

"PEARN'S"**PUMP.****CUSHIONING.**

PEARN'S combination of the SLIDE VALVE and PORTS in the AUXILIARY CYLINDER is the Simplest and most PERFECT CUSHION.

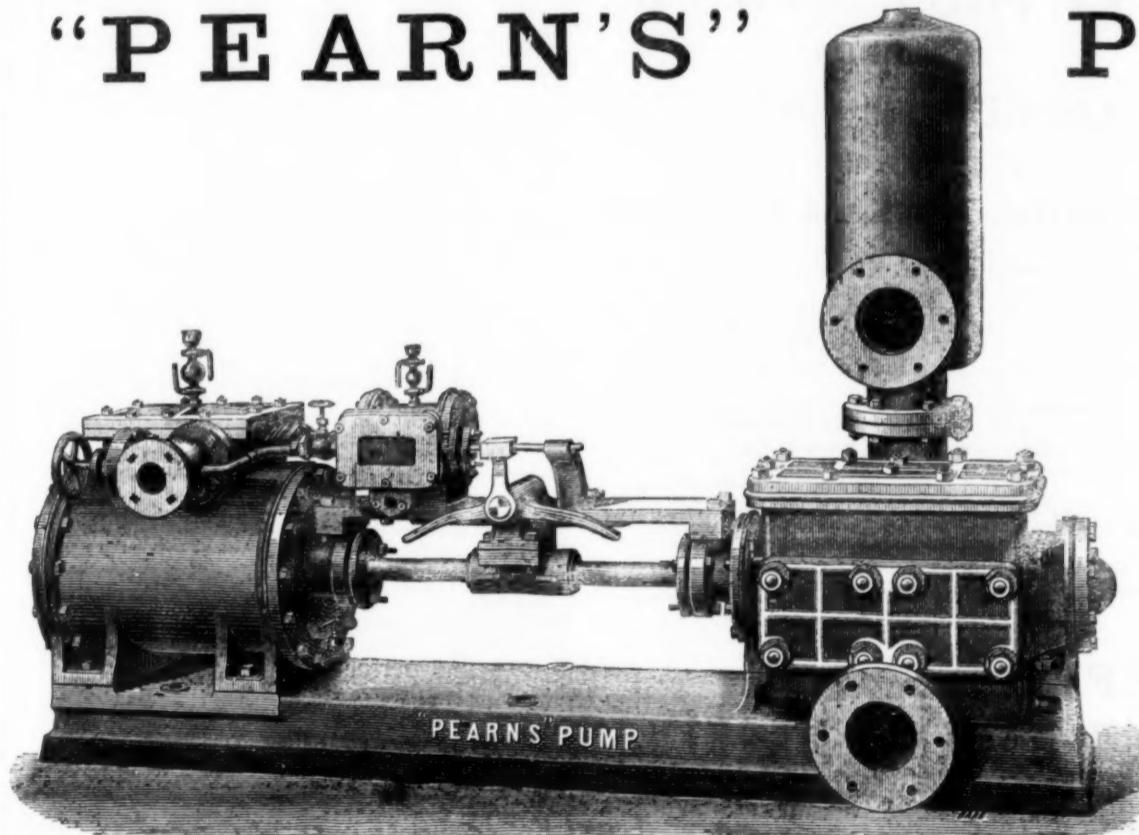
SIMPLICITY

AND

DURABILITY.

IT HAS NO INTRICATE PARTS,
the WORKING PARTS are the same as
used in the ordinary STEAM ENGINE.

It is as Simple and as DURABLE as
any Fly-wheel Pump, and cannot possibly
become DERANGED.



DIAMETER OF WATER CYLINDER..... In.	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14
DIAMETER OF STEAM CYLINDER.....	4 in.	5 in.	6 in.	6 in.	7 in.	7 in.	8 in.	10 in.	12 in.	12 in.	14 in.	14 in.	16 in.	18 in.
Length of Stroke	9 in.	9 in.	9 in.	9 in.	12 in.	12 in.	12 in.	12 in.	12 in.	18 in.	24 in.	24 in.	24 in.	24 in.
Content, Gallons per Hour	950	1500	2160	2940	3840	4860	6000	8640	11590	15360	19440	24000	34650	46360
Price..... £	18	21	24	28	35	39	45	60	70	85	130	140	180	230

FRANK PEARN AND CO., PATENTEE AND MAKERS, WEST GORTON, MANCHESTER.

JOHN MARSDEN,
MANUFACTURER OF

Air Tubing and Improved Brattice Cloth,

Tarred, Oiled, and Non-Inflammable.

THE OILED CLOTH IS ESPECIALLY RECOMMENDED FOR DAMP MINES, AND IS
ALSO A GOOD COVERING FOR SHEDS.
THE NON-INFLAMMABLE FOR THE MORE DANGEROUS MINES.

Samples and prices free, on application at the Works,



VARLEY STREET, OLDHAM ROAD,
MANCHESTER.

ALSO MANUFACTURER OF PACKING FOR ENGINES, PUMPS, &c., and STEAM HAMMER RINGS.

ASSURANCE AGAINST ACCIDENTS OF ALL KINDS.
ASSURANCE AGAINST RAILWAY ACCIDENTS ALONE.
ASSURANCE AGAINST FATAL ACCIDENTS AT SEA.
ASSURANCE OF EMPLOYERS' LIABILITY.

RAILWAY PASSENGERS ASSURANCE COMPANY
The oldest and largest Company, insuring against Accidents of all kinds.
The Right Hon. LORD KINNAIRD, Chairman.

SUBSCRIBED CAPITAL £1,000,000
PAID-UP CAPITAL AND RESERVE £240,000
MODERATE PREMIUMS.

BONUS ALLOWED TO INSURERS AFTER FIVE YEARS
£1,700,000

HAS BEEN PAID AS COMPENSATION
Apply to the Clerks at the Railway Stations, the Local Agents, or
64, CORNHILL,
Or 8, Grand Hotel Buildings, Charing Cross, London.

WILLIAM J. VIAN, Secretary.

BAINBRIDGE, SEYMORE, AND RATHBONE,
MINING AND CONSULTING ENGINEERS,
2, GREAT GEORGE STREET,
WESTMINSTER.



JOSEPH FIRTH AND SONS' New Patent Brick-making Machine,

Embraces the following advantages—viz.: Simplicity, strength, and durability. Compactness and excellence of mechanical arrangements, large producing capabilities, moderate cost. It makes two bricks at once, and will make 2,000 to 14,000 plastic pressed bricks per day, hard enough to go direct to the kiln without drying; or it will make the bricks thoroughly plastic if required. For works requiring a machine at less cost the machine is made to turn out one brick at once, and is capable of producing 8000 bricks per day. The Machine can be seen at work daily at the Brickworks of the Patentees, JOSEPH FIRTH AND SONS, WEBSTER HILL, DEWSBURY, and CROWBURY BRICK WORKS, SUSSEX; as also their Patent Gas Kiln for Burning Bricks, which possesses the following amongst other advantages, viz.,—Economy in Fuel, Rapidity and Quality of Work, even Distribution of Heat, and Total Consumption of Smoke.

W. F. STANLEY

MATHEMATICAL INSTRUMENT MANUFACTURER TO H.M.'S GOVERNMENT, COUNCIL OF INDIA, SCIENCE AND ART DEPARTMENT, ADMIRALTY, &c. MATHEMATICAL, DRAWING, and SURVEYING INSTRUMENTS of every description, of the highest quality and finish, at the most moderate prices. Price List post free.

ENGINE DIVIDER TO THE TRADE.
ADDRESS—GREAT TURNSTILE, HOLBORN, LONDON, W.C.



By a special method of preparation this leather is made solid, perfectly close in texture and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

HEPBURN AND GALE,
TANNERS AND CURRIERS,
LEATHER MILL BAND AND HOSE PIPE MANUFACTURERS,
LONG LANE, SOUTHWARK LONDON.
Prize Medals, 1851, 1855, 1878, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

Just published.

COAL MINING PLANT.

By J. POVEY-HARPER, of Derby.

Comprising Working Drawings 2 ft. by 1 ft. 8 in., taken from actual practice, illustrative of Colliery Plant and the Working of Coal, &c.

Price bound, or loose sheets in portfolio, £2 5s.; Or with the Designs for Workmen's Houses, £2 12s. 6d.

A carefully and thoughtfully executed series of working drawings of coal mining plant. The work is of the utmost possible utility to students and mine managers, and for those undertaking to open out new collieries, whether in this country or abroad, no more complete guide could be desired.—*Mining Journal*.

This is a very fine work, excellently got up, and well adapted for the purpose indicated. We strongly recommend the work on account of its extremely practical character to every colliery proprietor who may contemplate new erections or appliances in coal working, or who may be opening out new mineral property.—*Colliery Guardian*.

We have no hesitation in saying that a more useful work of its kind has never come under our notice. Every detail and measurement are given, and we may fairly say that such an elaborate and useful work has not been issued in recent years, if at all.—*Coal and Iron Trades' Review*.

London: Published at the MINING JOURNAL Office, No. 26, Fleet-street, E.C. Copies may be obtained by order of any bookseller, who can obtain them through their London agent.

**CAPTAIN ABSALOM FRANCIS, M.E.,
GOGINAN, ABERYSTWITH.**

SOUTH AUSTRALIAN MINES.—J. B. AUSTIN, ADELAIDE (Author of "The Mines and Minerals of South Australia," MINING AND GENERAL COMMISSION AGENT, has on hand several GOOD MINING PROPERTIES, in whole or in part—GOLD, SILVER, GALENA, COPPER, BISMUTH, ASBESTOS, MANGANESE, &c., &c.—offering good investment for English Capital.

References: A. L. ELDER, Esq., Bishopsgate-street; A. J. SCRUTTON, Esq., Stock Exchange; and Editor of the MINING JOURNAL, London.

M. R. P. S. HAMILTON (late Chief Commissioner of Mines for the Province of Nova Scotia), PRACTICAL GEOLOGIST, MINING AGENT, and MINING ENGINEER, HALIFAX, NOVA SCOTIA.

PURCHASES and SALES of MINING PROPERTY effected, with careful regard to the interests of clients.

THE IRON AND COAL TRADES REVIEW
The IRON AND COAL TRADES' REVIEW is extensively circulated amongst the Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron and coal districts. It is, therefore, one of the leading organs for advertising every description of Iron Manufacture, Machinery, New Inventions, and all matters relating to the Iron Coal, Hardware, Engineering, and Metal Trades in general.

Offices of the Review: 7, Westminster Chambers, S.W.

Remittances payable to W. T. Pringle.

WHAT IS YOUR DISEASE—WHAT IS YOUR REMEDY?

GRATIS, free by post on receipt of Two Stamps to pay Postage

THE BOOK OF POSITIVE REMEDIES.—It is the Book of Positive Medicine for the Cure of certain forms of Debility and Nervousness—viz: Mental and Physical Depression, Palpitation of the Heart, Noises in the Head and Ears, Impaired Sight and Memory, Indigestion, Pains in the Back, Headache, Piles, Constipation, Hysteria, Dizziness, Local Weakness, Muscular Relaxation, Nervous Irritability, Blushing, &c., resulting from Exhaustion of Nerve power, effect of Overwork, City Life, Worry, Brain Tum Intemperance, and other abuses of the system.

H. and H. SMITH and Co., Positive Remedy Laboratory, 26, Southampton-row, London, W.C.

1880-81.—MELBOURNE (AUSTRALIA) EXHIBITION.

Portable Engine—Gold Medal.

Thrashing Machine—Gold Medal.

The Royal Agricultural Society of England have awarded Every First Prize to CLAYTON and SHUTTLEWORTH for Portable and other Steam Engines since 1863, and Prizes at every Meeting at which they have contended since 1849.

GOLD MEDALS, AND OTHER PRIZES,

Have been awarded to CLAYTON AND SHUTTLEWORTH at the various International Exhibitions of all Nations, including LONDON, 1851, 1862; PARIS, 1855, 1867, 1878; VIENNA, 1857, 1866, 1873; for their

STEAM ENGINES, Portable and Fixed (For Coals, Wood, Straw, and every description of Fuel.)

TRACTION ENGINES, &c.

Catalogues in English and in all Continental Languages free on application.

CLAYTON AND SHUTTLEWORTH,
STAMP END WORKS, LINCOLN, & 78, LOMBARD STREET, LONDON.

LONDON—1862.



ESTABLISHED 1848.

W. BRUNTON AND CO.,
43, Cornwall Buildings, Queen Victoria Street, London,

MANUFACTURERS OF

PARIS—1878.



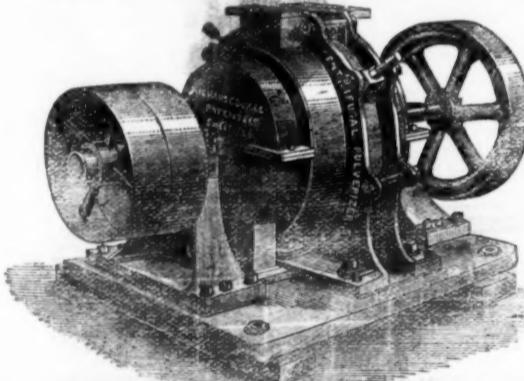
ALL KINDS OF SAFETY FUSE.

SILVER MEDAL (HIGHEST AWARD), MELBOURNE EXHIBITION, 1881, for

"EXCELLENCE OF MANUFACTURE." Works: Penhelleck Safety Fuse Works, Redruth, Cornwall and Cambrian Safety Fuse Works, Wrexham, North Wales.

LUCOPS' Patent Centrifugal Pulveriser,

(Two tons per hour with 5 horse power actual.)



For reducing to an impalpable powder, or to any requisite degree of fineness, all materials capable of being thus treated. CEMENT, CHEMICALS, GRAIN, COAL, COLOURS, PHOSPHATES, LIME, COPPER, TIN, ZINC, and other Ores with rapidity, completeness, and perfect uniformity.

THE ONLY GUARANTEED MACHINE FOR GOLD QUARTZ.

This mill consists of a circular iron casing, the section being elliptical in form, and is fixed vertically on a firm bed or foundation plate, shaft runs through the centre of the casing on which is keyed a series of arms, in the extremities of which revolve two or more slightly oblong iron rollers, which, when put in motion, fly off from the centre and run upon the interior periphery of the casing, and by centrifugal force crush and pulverise the article under treatment.

The effect produced by this system is most extraordinary in its practical results, the power required is small in consequence of the comparative absence of friction from the working parts of the mill, the combined results of the rolling action of the crushers and their impact by centrifugal force on the material, being the same in kind, but in degree far exceeding that of edge runners, the sides of the casing are formed as open wire sieves of the degree of fineness required, and a series of propelling blades attached to and revolving with the central shaft drive the material under treatment through the sieves as it is pulverised; by this arrangement the degree of fineness can with certainty be arrived at from coarse to extreme fine, and that with uniformity.

Intending purchasers can at all times satisfy themselves by sending the material they wish to operate on, and seeing it pulverised over 300 in use. Prices and testimonials free on application.

RICHARD COOK & CO., ENGINEERS, SHEFFIELD.

LONDON, 147, QUEEN VICTORIA STREET, E.C.—R. G. FOOT, AGENT.

TELEGRAPHIC ADDRESS:—LUCOP, SHEFFIELD.

ESTABLISHED 1852.

SYBRY, SEARLS, AND CO.,

MANUFACTURERS OF THE

CELEBRATED MINING STEEL, BRANDED

Cast Steel, Shear, Blister, Spring, Hammer, and Pick Steel.

Special Rock Drill Steel.

Mining Tools, Files, Saws, Hammers, and Picks.

CANNON STEEL WORKS, SHEFFIELD.

THE DYNAMO-ELECTRIC MACHINE SUPERSEDES EVERY KNOWN BATTERY.

WILLIAM ELMORE,

91, BLACKFRIARS ROAD, LONDON, S.E.

SPECIALITIES.**“Elmore” Dynamo-Electric Machine****Special Polishing Machinery and Materials.****SPECIAL ELECTRO-DEPOSITING SOLUTIONS**

For depositing **Copper** in any thickness upon rough castings or polished Iron objects of any size or weight, Locomotive Boiler Tubes, Iron Railings, Ornamental Lamp Posts, Garden Seats, Iron Sheets, and parts of heavy Iron Structures.

For depositing **Brass** upon Ornamental Iron Work, Fenders, Fire Irons, Locks, Bright Steel Goods, and upon articles made of Lead, Pewter, Zinc, Tin, and Britannia Metal.

For depositing **Tin** upon Bright Steel Goods, or upon rough Iron. The insides of Iron or Copper Pans, Kettles, and Culinary Utensils (Chemically pure).

For depositing **Copper** reproductions of Art Subjects, Stove and Door Panels, Plates, Medallions, &c., from Plaster, Wax, or other Moulds.

For Covering the most delicate Ferns, Flowers, Insects, &c., by which perfect facsimiles can be obtained in Copper and finished in Silver, Gold, or other Metals, or various coloured oxides, forming the most elegant ornaments which can be manufactured at a nominal cost.

For depositing **Electrotypes** for Printers, Steel Plate and Bank Note Engravers, &c.

For depositing **Steel** or **Nickel** upon **Copper Electrotypes**, to protect the surfaces from the action of Mercurial Inks, and at the same time preserving the clear brilliancy of vermillion, and other colours having mercury in their composition.

For depositing **Tin** upon the backs of **Electrotypes**, completely superseding the old method.

For depositing **Gold**, **Silver**, **Nickel**, **Bronze**, **Zinc**, &c., in **Electro-Plating**.

SPECIALITIES.**“Elmore” Dynamo-Electric Machine**

For **ELECTRIC LIGHTING** (Arc and Incandescence) for Public Streets and Gardens, large Open Spaces, Theatres, Factories, Workshops, Hotels, Houses, &c.

ENTIRE SYSTEM COMPLETE, EFFICIENT, AND INEXPENSIVE.

Special Apparatus for the application of Ozone and other Gases for Bleaching Oils, Sugars, Fabrics, &c.

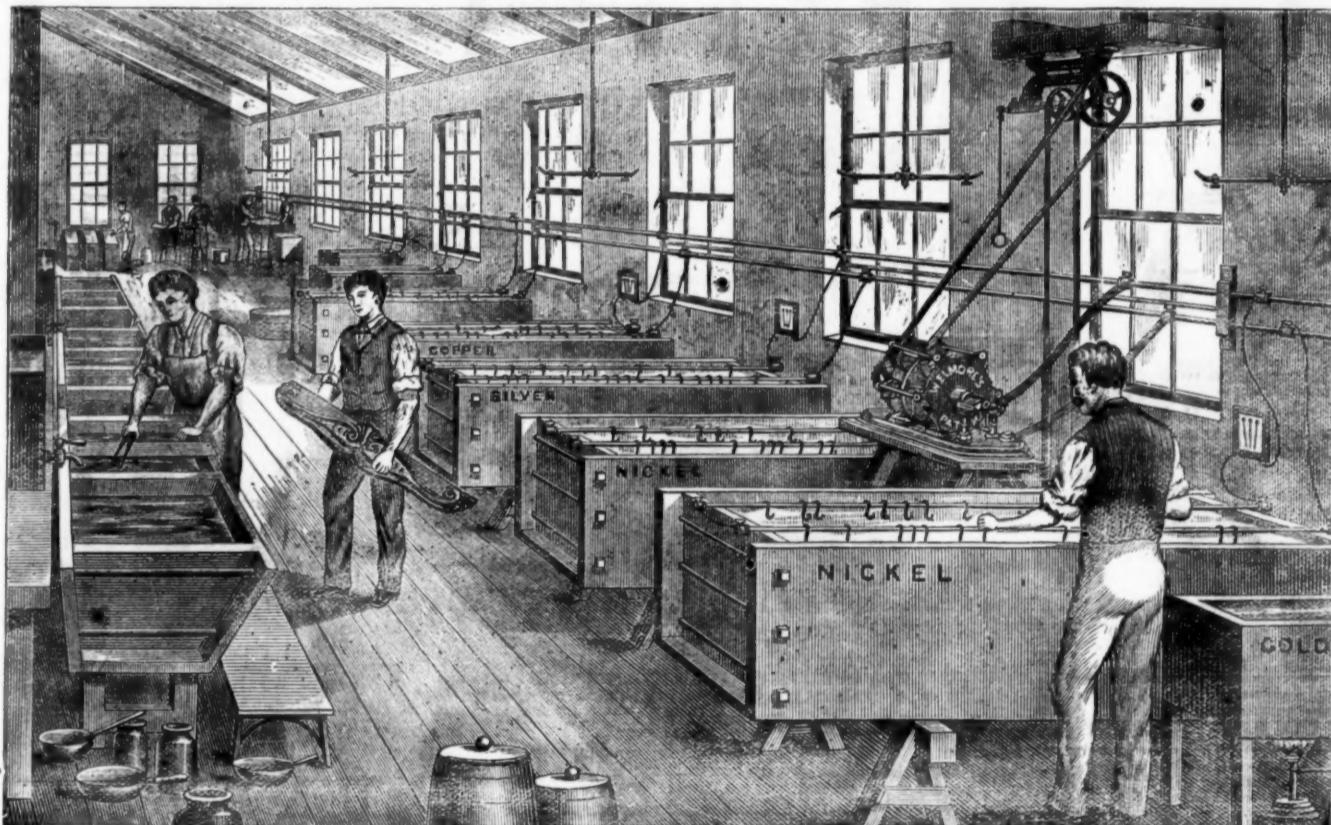
Complete Outfits. The “Elmore” Machines and appliance for **TIN-PLATE MANUFACTURE**.

Complete Outfits. The “Elmore” Machines and appliance for **GALVANIZING**.

Complete Outfits. The “Elmore” Machines and appliance for **REFINING METALS**.

Complete Outfits. The “Elmore” Machines and appliance for **EXTRACTING METALS FROM ORE**,

Complete Outfits. The “Elmore” Machines and appliance for **GENERATING OXYGEN**, Hydrogen, Chlorine, Ozone, and other Gases.



The above represents an Electro-Plating Works in which an “ELMORE” PATENT DYNAMO-ELECTRIC MACHINE is being used for the simultaneous deposition of Nickel, Silver, Copper, Bronze, Brass, Gold, Tin, Zinc, &c., from their Solutions.

TESTIMONIALS, &c.**From the “HARDWARE TRADE JOURNAL.”**

“Mr. WILLIAM ELMORE, of 91, Blackfriars Road, London, S.E., is busily engaged fitting up the Art Metal Depositing Works of the Electrolytic Company, Charlotte Street, Blackfriars. The Electro-plating tanks of nickel, copper, brass, zinc, and tin, holding several thousands of gallons each (worked by an ‘Elmore’ Patent Dynamo-Electric Machine, capable of depositing about 500 lbs. of metal per day), and the specially designed and constructed polishing machinery will all combine to constitute this most gigantic and complete arrangement of the kind in the world. Here boiler tubes, each over 20 ft. in length, may be coated with copper, large ornamental iron lamp posts, and similar massive iron structural objects of great weight may be covered with electro-deposited copper, forming, when finished, a complete shell of bronze, which may be nickel-plated, or even silver-plated, if desired. Large rough or polished iron surfaces may be coated with brass, or zinc, or tin. Copper electrotype copies are taken of art subjects, the reproduction being so perfect that the process is used for multiplying plates from which bank-notes are printed, and the most delicate ferns, flowers, leaves, and insects are coated with copper, and afterwards with gold, silver, nickel, &c., for use as ornaments of various kinds. Fenders, fire-irons, grates, &c., may be brassed. The largest marine engines may be nickel-plated in the large nickel-plating plant, worked by the powerful ‘Elmore’ machine with ease and certainty, which only a few months since would have been pronounced almost impossible. The Electrolytic Company, we understand, express perfect satisfaction with the work already completed by Mr. Elmore, and there is no doubt that with that gentleman’s large practical experience the company could not have been in better hands. The entire premises will be lighted by the ‘Elmore’ system of electric light.”

From the “LONDON MINING JOURNAL.”

“The new ‘Elmore’ Dynamo-Electric Machine can be seen in operation in London, and is considered one of the most wonderful scientific apparatus which has yet been brought before the public; it should be inspected by all who are interested in any kind of metallurgical operations.”

“Mr. ELMORE has just received two pieces of ordnance from Her Majesty’s Works at Chatham, with an order to nickel-plate the same, together with the carriages upon which they are mounted. Mr. Elmore has done similar work for the Government on previous occasions, and it will be remembered that the screw propellers used on the torpedo boats were nickel-plated by him. The ‘Elmore’ Dynamo-Electric Machines and complete electro-plating outfit have been supplied to Government Departments at home and abroad.”

Dynamo-Electric Machines, Outfits, &c., supplied to (London) Messrs. Thos. De la Rue and Co., Cassell, Petter, and Galpin, The India Rubber Company (Limited), Silvertown, The Nickel Plating Company, Joseph Woodricker, Kelly and Co., A. S. Cattell and Co., &c., &c., (Birmingham) Messrs. Wright and Butler, Joseph Woodward, The Griffin Gilding and Plating Company, and over 500 others.

SEND FOR COMPLETE DESCRIPTIVE CATALOGUE, PRICE 6D.

COMPLETE WORKING OUTFITS SUPPLIED.

From the NICKEL PLATING COMPANY,

“Your Machine does its work most satisfactorily, and has never once reversed current, which the Weston Machine frequently did.”

From the ELECTROLYTIC COMPANY,

ART METAL DEPOSITING WORKS,
CHARLOTTE STREET, BLACKFRIARS, LONDON.

“The ‘Elmore’ Dynamo-Electric Machine and entire outfit which you have supplied to this company have given perfect satisfaction.”

From the NICKEL AND SILVER PLATING WORKS,

2, CHARLES STREET, CURTAIN ROAD, E.C.

“Having had one of the ‘Elmore’ Patent Dynamo-Electric Machine in constant use for several months, it gives me great pleasure to say that with it I have been able to deposit four times the weight of metal per day which I had been enabled to do with the Dynamo-Electric Machine, which it has displaced in my establishment.”

From the LONDON NICKEL PLATING COMPANY.

“We have much pleasure in expressing our entire satisfaction with the nickel-plating solution, anodes, and Dynamo Machine that you have supplied us with.”

From the DYNAMO-ELECTRIC PLATING WORKS,

2, OLD SWAN LANE, LONDON.

“The quality of the nickel solutions and anodes at these works, which were supplied by you, is most satisfactory in every way. The Dynamo Machine also works excellently, and has given no trouble whatever since it has been started.”

AND MANY OTHERS.

INFRINGEMENTS.—H. R. MARSDEN having obtained information of infringements of his numerous Patents, hereby gives notice that he will PROCEED AGAINST ANY ONE HE MAY DISCOVER MAKING OR USING THE SAME.

PARIS EXHIBITION, 1878. GAINED THE GRAND PRIZE. THE TRIPLE AWARD. Gold Medal, Silver Medal, and Honourable Mention in competition with all the World.

THE BLAKE-MARSDEN NEW PATENT IMPROVED STONE BREAKERS AND ORE CRUSHERS.

ORIGINAL PATENTEE
AND ONLY MAKER.

H. R. MARSDEN, NEW PATENT FINE CRUSHER OR PULVERIZER,

FOR REDUCING TO AN IMPALPABLE POWDER, OR ANY DEGREE OF FINENESS REQUIRED,

GOLD QUARTZ, SILVER, COPPER, TIN, ZINC, LEAD,

AND ORES OF EVERY DESCRIPTION;

Also Cement, Barytes, Limestone, Chalk, Pyrites, Coprolite, &c., &c. These Machines are in successful operation in this country and abroad, and reference to users can be had on application.

PATENT REVERSIBLE CUBING and CRUSHING JAWS, IN FOUR SECTIONS, WITH PATENT FACED BACKS, REQUIRING NO WHITE METAL IN FIXING.

NEW PATENT CRUCIBLE CAST-STEEL CONNECTING RODS.

NEW PATENT RENEWABLE TOGGLE CUSHIONS, &c.

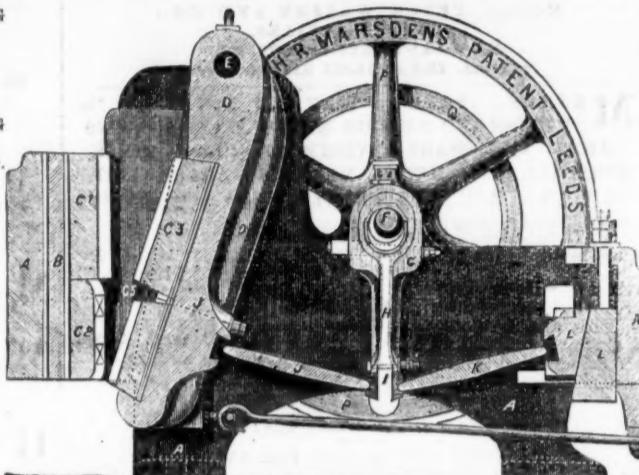
OVER 4000 IN USE.

EXTRACT FROM TESTIMONIALS. PULVERISER.

"I have great pleasure in bearing testimony to the merits and capabilities of your patent combined fine crusher and sieving apparatus. I have tried it on a variety of ores and minerals, and it pulverizes them with equal success. You can put in a small paving stone, and bring it out like flour."

"The power required to drive it is very small, being from 4 to 8-horse, and the repairs are almost nil."

"I am sure the machine will be a success, and a great one, and there is any amount of demand for such a machine. We can work it with 20 lbs. of steam, and our engine, which is a 12-h.p., plays with the work, in fact we run the Stonebreaker and the Pulveriser both together with 35 lbs."



ALSO PATENTEE AND ONLY
MAKER OF THE

AWARDED OVER

60

FIRST-CLASS GOLD AND SILVER MEDALS.

ADOPTED BY THE PRINCIPAL CORPORATIONS, CONTRACTORS, MINING COMPANIES, &c., IN ALL PARTS OF THE WORLD.

ROAD METAL BROKEN EQUAL TO HAND, AT ONE-TENTH THE COST.

EXTRACTS FROM TESTIMONIALS. STONEBREAKER.

"The 15 x 8 stonebreaker gives perfect satisfaction. It produces a more cubical stone than any others I have seen at work."

"Your 15 x 10 machine makes the best road metal I have ever seen put through a machine—in fact, comparing favourably with hand broken."

"Your 10 x 7 crusher at the Aruba Gold Mines will crush 90 to 100 tons per 24 hours of the hardest gold quartz to 1' size."

"Some of your testimonials do not give your machines half their due. I have seen men hammering away on a big rock for a quarter of a day which your machine would reduce to the required size in a quarter of a minute. I would guarantee that your largest size machine would reduce more of the Cornish tin caps (which is the hardest rock of England) in a day than 200 men, and at 1-25th the cost."

GRATELY REDUCED PRICES ON APPLICATION.

FOR CATALOGUES, TESTIMONIALS, &c., APPLY TO THE SOLE MAKER,

H. R. MARSDEN, SOHO FOUNDRY, LEEDS.

JOHN CAMERON'S

SPECIALTIES ARE HIS

STEAM PUMPS

FOR

COLLIERY PURPOSES.

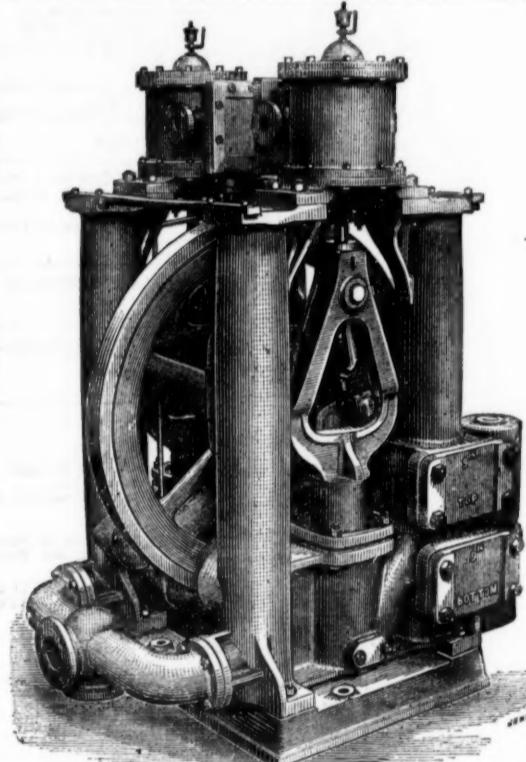
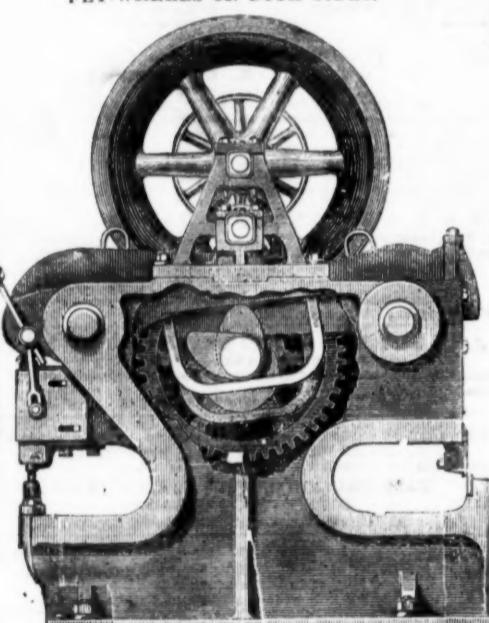
Specially adapted for forcing Water any height
ALSO, FOR

SINKING, FEEDING BOILERS AND STEAM FIRE ENGINES,

which he has made over 8000.

ALSO, HIS

PATENT CAM AND LEVER PUNCHING AND SHEARING MACHINES.



Works: Oldfield Road, Salford,
Manchester.

THE "CHAMPION" ROCK BORER

MINE AND QUARRY STANDS, STEEL DRILLS, SPECIALLY PREPARED INDIARUBBER HOSE, TESTED IRON PIPES, &c.

Mr. BUM 50 Almada, 100 Akanoo, 40 Bedford, 100 Calais, 25 Copiapo, 5 Carnarvon, 20 Colorado, 100 Chile, 40 Devonport, 50 Devonport, 100 Devaia, 75 Devonport, 60, 6d, 10 Devonport, 50 Don Pedro, 40 Drake, 50 East Blue, 3 East Pool, SPECIAL

IMPORTA
GESSIVE
sent prices,
best few mo
Mr. BUM
to afford reli

WHEAL G
for investme

OFF

M.R. J

MES

Have Agents
Australia, and
Inspection
Advice as to

Air-Compressing Machinery,

Simple, strong, and giving most excellent results.

Full particulars of rapid and economical work effected by this machinery, on application.

R. H. HARRIS,

ENGINEER,

63, QUEEN VICTORIA STREET, LONDON, E.C.

J. WOOD ASTON AND CO., STOURBRIDGE

(WORKS AND OFFICES ADJOINING CRADLEY STATION).

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES, FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS, RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions

WELDED STEEL CHAINS

FOR CRANES, INCLINES, MINES, &c., MADE ALL SIZES.

MAPS OF THE MINES, AND OF UTAH TERRITORY
FROISETH'S NEW AND REVISED MAP FOR 1875.—
Size 40 by 56 inches, scale 6 miles to the inch. Handsomely engraved, coloured in counties, showing the Towns, Settlements, Rivers, Lakes, Railroads, Mining Districts, &c., throughout the Territory, and all the Government Survey to date. Mounted on cloth, £2; half-mounted, £1 12s.; pocket form, £1.
Also, GENERAL MINING MAP OF UTAH, showing twenty-eight of the principal Mining Districts adjacent to Salt Lake City, and location of the most prominent mines. Price, pocket form, £s.
Also, NEW MAP OF LITTLE AND BIG COTTONWOOD MINING DISTRICTS, showing the location of over Four Hundred Mines and Tunnel Sites, together with the Mines Surveyed for United States Patent. Price, sheets, 6s.; pocket form, 6s.
For sale, and supplied by—
TRUBNER and CO., 57 and 59 Ludgate Hill, London.
B. A. M. FROISETH, Salt Lake City, Utah, U.S.

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors) at their offices, 26, FLEET STREET, where all communications are requested to be addressed.—June 3, 1882.